Victor A. Novozhenov

Communications and the Earliest Wheeled Transport of Eurasia

Edited by E.E. Kuzmina

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In his new book, the author treats the problems of ancient Eurasian societies in completely unexpected and innovative ways, reconstructs the wheeled transport and mythological ideas of the ancients and their ritual practice based on the latest achievements in the archeological science.

The miracle of communication consists in a rapid spread of new knowledge and inventions over long distances, which allowed ancient societies to apply such innovations in everyday life, and their rulers to use these «wonderful» achievements in managing their clans and large-scale projects. The ability of societies to quickly perceive and copy the wonders of technology – both ancient and modern – underlies the economic progress of nations.

The book is illustrated with rare and little-known materials from the Louvre, the Hermitage, the Guimet Museum, historical museums in Urumqi, Xi'an, and many others. A significant part of the publication are materials collected during numerous archaeological expeditions to Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, China, India, as well as in Bulgaria and France.

The book is supplied with an electronic multimedia application which contains, additionally to its electronic version, more than 4GB of various illustrative materials, for various reasons absent in the present book, the previous editions by the same author, as well as exhibits and video catalogs of leading world museums related to the problem of chariots.

The author addresses his book primarily to young researchers, students, graduate students – all those whose enthusiasm is so lacking now in the study of ancient mysteries in history of the Eurasian steppes.

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Editor's preface

Wheeled vehicles were invented by natives of the Ancient Orient civilization at the end of 4th – 3rd millennium BC and since then they continue evolving year by year, sweeping the globe. Their invention was one of the greatest achievements in human history. It is the use of wheeled transports that provided quick colonization by Indo-Europeans and establishment of the broadest cultural ties between Scandinavia and China, the Eurasian steppes and India.

This naturally caused great interest of scientists to the problem of history of transport, starting with the classic works of Gordon Childe (Childe 1954), Mary Aiken Littauer and Joost Crouwel (Littauer, Crouwel 1979), and Stuart Piggott (Piggott 1983).

The number of studies in this area of communication is truly enormous. And the present work occupies a completely unique place in that pool of information.

Name of Victor A. Novozhenov became famous upon publication in 1994 of his valuable book «Rock paintings of carts in Middle and Central Asia». Nevertheless, the present work by the scientist is a brand new study in history.

Its novelty is expressed by three factors:

1. Previously unknown extension and completeness of sources;

2. An innovative, carefully reasoned and detailed classification system of all source types.

3. Adoption of a wide range of sources on history of transport in China for scientific use.

All these made the book «Miracle of Communications and the Earliest Wheeled Transport of Eurasia» a new word in history of wheeled transport of the Old World.

First of all, the author rightly considers the process of transport development as a true miracle of communication.

While characterizing the sources, V.A. Novozhenov utilizes genuine findings of wheels, carts and chariots and their models taken from archaeological monuments, data of radiocarbon dating and conclusions by paleozoologists on findings of cart animals: bulls, horses, camels, and also different types of records, including Indo-Iranian descriptions of transport and visual sources from stamps of Asian Near East to petroglyphs, which were paid their due attention.

It should be noted that data on ancient vehicles up to the moment have never been used by the world science in such fullness.

Of fundamental importance is the section on tools and methods for classification of sources, which was processed by use of computers and electronic mapping.

Chapter I is dedicated to classification of cart images and mapping of types, ranging from Scandinavia, the Mediterranean and the Sahara to the northern Black Sea, the Caucasus and on up to eastern Siberia.

The next section deals with style features of selected types, subtypes and their variants, which makes up the core of the study.

Chapter II characterizes the most ancient centers of application of wheeled vehicles, with special attention to monuments of the pit archaeological community (Merpert 1968) and the Novotitorovo culture of Azov (Gay 2000).

As for the eastern part, information on wheeled transport there is provided by wall pictures, slabs of burial boxes and petroglyphs. An attempted analysis allowed the author getting to the crucial issue of Eurasian history – on times and routes of migrations during the 3rd – beginning of 2nd millennium BC.

He arrives to a just conclusion that wheeled transport originates in the last quarter of the IV millennium BC in the most developed region of the Old World, in Sumer and the adjacent ancient agricultural centers. It was conditioned by other two innovations: appearance of a potter's wheel and development of specialized metal production. It is from this center that carts subsequently spread throughout Eurasia. And in the steppes of southern Siberia, in Altai and western Mongolia, influenced by pastoralist groups penetrated here from the west, a single cultural and historical community was formed out of agents of a similar anthropological type, material culture, which probably had also a unified system of religious and mythological concepts.

Chapter III «Age of chariots: beginning of the 2nd millennium – end of the 1st millennium BC» is dedicated to an outstanding discovery by Soviet scientists who studied the burial of warriors-charioteers, on both sides of the Urals and in Kazakhstan. This innovation opened a new chapter in history of military affairs of the Old World and spread all over the steppes (monuments like Sintashta-Potapovka) and the Middle East. An issue of independent invention of chariots there still causes debates.

A special section is devoted to China's chariots. Summarizing the data of archaeological excavations of chariots (including the latest), works by Chinese archeologists and visual and written sources, Victor A. Novozhenov comes to a safely reasoned conclusion about borrowing from the steppes of horses and chariots, and their subsequent local development in China.

The book contains 45 printed text pages with a huge bibliography, 183 figures (including color maps), glossary of terms,

color tables of correlation of database types by regions, indexes of monuments both for regions and image feature groups, as well as a catalog of Eurasian and North African rock cart drawings, Appendix 2 «Chinese chariots» and Appendix 3 «Overview of recent years' findings».

Being occupied with history of wheeled transport for more than half a century, I can appreciate the great progress in study of the area, and, at the same time, appreciate the utmost importance and innovative nature of the monograph by Victor A. Novozhenov.

I shall admit that I am not entirely agreed with the historical conclusions of the author concerning his acceptance of the hypothesis by V.V. Ivanov and T. Gamkrelidze (1984) about Indo-European migration via Turan and Central Asia (from Anatolia).

But this does not detract from the work of Victor A. Novozhenov, and gives it a special urgency today, because only the joint consideration of linguistic data and archaeological realities of the Indo-European culture, especially of the Indo-Iranian one, with their special cult of horse, carts and chariots, can help in solving the problem.

The key link in this upcoming project will be this impeccably executed book by Novozhenov, which shall become a reference book for an archaeologist and a linguist alike. ■

Doctor of Historical Sciences
Elena E. Kuzmina

Notes

GAMKRELIDZE T., IVANOV V.V.1984. Indo-European Language and Indo-Europeans. Ch 1-2. Tbilisi.

CRITICISM, SEE: DYAKONOV, I.M.,1982. On the ancestral agents of Indo- Novozhenov dialects / / BDN № 3, 4; Mallory J.1989. In Search of the Indo-Europeans: Language, Archaeology and Myth. London.1989;

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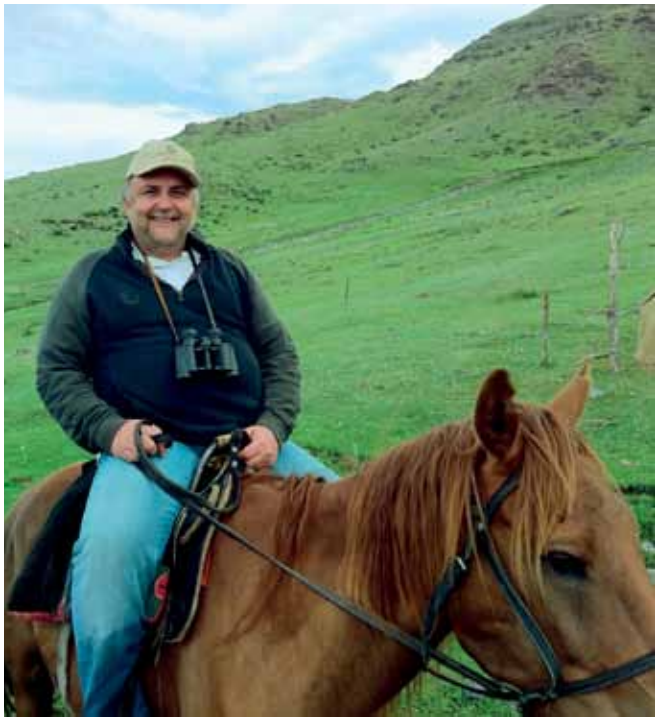
Author's foreword



The main materials of the book have been collected and published two decades ago. The book was printed in few copies, on newsprint, with very poor quality of figures – a typical result of the challenging times. For this reason, many important details have been lost. But, despite this misfortune, the book became noticeable, in demand, and even caused some scientific debate among experts; my fellow archaeologists had strongly advised its reissue.

But to this moment I got involved in other things, very remote from archeology, as I thought. I plunged into the turbulent world of journalism, became a media manager, a specialist in mass communications of a young state of Kazakhstan, which just acquired its independence.

With enthusiasm, typical to those blessed 1990s, I was creating electronic mass media: new independent newspapers, radio and television. I was mastering, like many in those days, a new profession, and new horizons. Archeology had long to be forgotten. Only now, long after many years, having earned an extensive experience in mass media, PR, advertising, having set up new channels of communication between different social groups and organizations, I began to realize that my entire conscious life, in essence, was dedicated to the same things.

Archaeology as a science is not static. The bulk of new unique artifacts appeared over the last years, methods of radiocarbon dating of ancient monuments of the Eurasian steppe significantly improved,

which altogether allows taking more reliable solutions to issues of synchronization of archaeological cultures revealed here, and, correspondingly, allows considering more convincingly the rise of the earliest channels of communication in the «pre-silk road» period.

My wise mentors who introduced me into the wonderful world of Asian petroglyphs: J.A. Sher, H.-P. Frankfort, A. N. Mariashev – published systemic generalizing works, my colleagues: Z.S. Samashev, A.E. Rogozhinskiy, I.N. Shvets – achieved impressive results in the study of petroglyphs of Kazakhstan and Central Asia. New works on petroglyphs of Central Asia by our colleagues from Russia and other neighboring states were made public. The largest specialist in the Bronze Age of Eurasian steppes and the Indo-Iranian subject matter, E.E. Kuzmina has published a series of brilliant and conceptual works.

Published were striking materials on fortified settlements of Sintashta and Arkaim and the results of radiocarbon analyses, which clarified their dating and radically changed many of my earlier ideas about the Bronze Age tribes of the steppe Eurasia.

The Chinese colleagues have unearthed new «chemakyns». These are graves with chariots and weaponry complexes of the Shang and Western Zhou Dynasties. The Russian counterparts found a new four-wheel carts of the Aeneolithic period in the Black Sea and the southern Russian steppes.

However, I wrote this book, first of all, for young researchers and students, all those whose youthful maximalism and enthusiasm are badly needed in the study of many undeservedly forgotten in our time amazing ancient periods of allegedly «barbaric» history of many nations inhabited and inhabiting now the vast territory of the Eurasian steppe.

All these and much more were reflected in the book, written and illustrated virtually anew.

To present the black-and-white rock paintings already published in numerous editions, I deliberately utilized a very controversial method for reconstructing an initial appearance of these compositions by overlaying the original sketches on an arbitrary colorful rock texture (collage). Such visualization is dictated by the objectives of the whole study and by an attempt to assess the perception by the ancient auditorium of communication channels being reconstructed here.

I finish writing these pages in Xian, a beautiful city, where the antiquity intricately intertwined with the modernity, the old capital of China's Tang Dynasty, a place, where once began the Great Silk Road, a transcontinental transport corridor, which connected the great civilizations; precious silk was first invented here, the first ancient Chinese dynasties and their first states emerged here; wonderful antiquity artifacts capable of outshining the famous «Seven Wonders of the Ancient World» were found here, the fantastic ancient chariots were dug out here, with great care, unique to the Chinese.

Who knows: perhaps many of the secrets of modern Chinese economic miracle should be sought here, in these amazing monuments? Reflections on this theme are conveyed by these pages. And only You, dear reader, could judge what came out of it. ■

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Almaty – Beijing – Xian,
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Great thanks to Professor J-C. Garden (the Higher School of Social Research, the Institute of Man, Paris), Professor H.-P. Frankfort, P. Vidal, R. Bezenval (the France National Center of Scientific Research, Paris) and A. Cubet (Director of the Department of Oriental Antiquities of the Louvre) for unique opportunities to work with the monuments of ancient art in Europe and with rare collections of the museums in Paris.

This book is the result of many years of discussions, joint complex expeditions, and it is written with the assistance and direct involvement of many my colleagues and friends to whom I shall express my appreciation: to T.G. Shakirov for many years of understanding and support, to the staff of the Sary-Arka Archaeology Institute: A.Y. Chindin, V.V. Varfolomeev, I.V. Rudkovsky, E.R. Usmanova, I. N. Shvets, M.V. Bidelbaeva, J. S. Smailov, A.Z. Beisenov, I. A. Kukushkin, V.G.Loman, L.A.Evdokimova; to employees of the Archaeology Department at the Kemerovo University: A.I. Martynov, D.A. Smirnov, V.V. Bobrov, Yu. Mikhailov, L.N. Ermolenko, A.V. Fribus, O.S. Sovetova, N.S.Blednova, A.P.Senchilov; to representatives of the glorious school of Cheliabinsk archaeology: N. O. Ivanova, A.V. Epimahov, I.V. Chechushkov, who did not let me disappear as an archaeologist; to collegues: D.Gergova and L.Ninov (the Bulgarian Academy of Sciences), T.Damgard (an expert of the Viking Ship Museum, Denmark), N.Nielsen (the Copenhagen University).

The book was prepared for printing by the «KITs» company established and led during many years by my talented and successful student O.G.Agapova. Great thanks to the whole team for your hard work.

Distinct thanks for understanding to B.B.Kodjakhmetov, my colleague from the Bureau of Communication Miracles «Rating+», a wonderful journalist and a top-class specialist in media communications.

Materials and information stored in the collections of the following museums were utilized in the present book: the Hermitage (St. Petersburg), the State Historical Museum (Moscow), local history museums in Abakan, Minusinsk, Krasnoyarsk, Karaganda, Dzhezkazgan, Almaty, Balkhash, Astana, as well as of the Department of Oriental Antiquities in the Louvre (Paris), the Guime Museum in Paris, the National Museum of Denmark and the Glyptothek (Copenhagen), the Viking Ship Museum in Roskilde (Denmark), the historical museums in Xi'an, Henan province – the funeral complexes of the Emperor Qin Shihuang (Baymayong) and the emperors of the Han Dynasty (Yangling), the Museum in Urumqi, Xinjiang province (China), as well as of the Experimental Archaeological Center in Leer (Denmark), of the archaeological Reserve «Sboryanovo»(Isperih, Bulgaria) and of the French National Center for Scientific Research (Paris, CNRS, upr. 315). ■

In place of introduction

«Every lauded present is but a moment, immediately becoming the past, and to return this morning is not easier than the Punic era, or the Napoleonic wars. And whatever paradox it seems to be, the modernity is sham while the history is too real.»

L.N.Gumilev

The great miracle of communication

Any person, as a social being, cannot live without communication. This is required by our physiology, it is our natural state to keep creating around ourselves various channels of communication. The sad story of Kipling's Mowgli and of his real-life prototypes, as well as of Robinson Crusoe and Friday are well known.

In the modern society, we are surrounded by numerous and diverse communication channels, which quietly and routinely provide us with anything necessary for a full and comfortable life, productive work and effective education, training, as well as with travels and entertainments. We adopt another technological advance by buying the newest model of a fashionable device or other miracle of modern technology, each time making the already overdone and very intricate network of modern communications even more complex.

Among this variety, distinguished are basic traditional systems of communication channel, shaped by humanity for thousands of years of its history: writing, music, dance, painting, various kinds of art, and world religions. As well as well-established channels of exchange, trade, gradually transformed into the global transportation arteries; these are routes of land, sea and air transport, modern logistics, a variety of global electronic network, every second transmitting worldwide terra-bytes of all sorts of information. In a word, it is the whole transport infrastructure, which determines levels of development of a human civilization that created it.

But it was not always like that. Often, development of new channels of communication led to wars, conflicts and humanitarian disasters. History of human civilization, in essence, is a history of development of a world infrastructure and of formation of ramified communication networks of various kinds.

Types of global networks of modern communication are represented by most popular informational or public communication channels: literature of various thematic orientation, magazines, newspapers;

electronic media of radio and television. The rapidly growing internet – the World Wide Web – became a revolutionary channel, in the depths of which mushrooming up are global social networks and various independent channels of personal communication. The last decade saw «mobilization» of population, i.e., the global spread of various personal devices and corresponding communication channels based on the mobile technologies.

At the same time, the simplest social tasks of communication channels are well known: to communicate, to teach, to educate, to inform and to entertain. More complex tasks are to shape public opinion in a needed direction, to advocate ideological stereotypes, to form certain «myths» and «legends», behavior models, and certain social norms.

All variety of contemporary mass communication channels could be seen as of two types, internal and external channels: the former operate within a single society, providing communication between their individuals or groups, the latter are to ensure communication between societies, separate countries and entire continents.

A list of contemporary communication channels could be infinitely long. Important is that, having now the entire communication channel system globalized, at the output one has an incredible totality of absolutely various information attacking individuals and which is hardly feasible to process and understand physically.

Since information in combination with effective communication channels became the most universal and valuable commodity in the modern world, the possession of which guarantees an unprecedented advantage and control over the society and individuals, the principal role in this story belongs to those who own and form specific channels. Owning and manipulating a communication channel gives control over the world. This process with all its techniques and outcomes of «zombie-making» is well described by V. Pelevin in his cult novel «Generation P». There is no better design!

In other words, the modern communication channels bring us a wealth of information, which is used by someone to form a certain «message» in our minds: a message, an image, which, in turn, makes us act this or another way, to buy a particular product, to dress certain fashionable clothes, to vote for such and such a candidate, and so on.

Thus, we see that at the output of the globally developed modern infrastructure one gets a huge flow of diverse information, which is not possible to comprehend due to limitations of a human physiological capacity. So one tries to perceive information selectively, and what is not clear or does not fit own adopted system of life values, the individual either ignores or treats as something «supernatural», «wonderful». Do we think, speaking on cell phone, what sort of complex physical processes occur inside the phone pipe, what electromagnetic waves transmit a signal to our interlocutor? We have long admitted for ourselves that our gadget is just another «miracle» by a modern technology.

Most often, such a communication operates in a much simpler way: the valid communication channel is loaded with a prepared «message», explaining a strange phenomenon or a datum at the level of perception by a communication target. And here it is, the «miracle» of communication: one forms a desired public opinion, manages public opinion, i.e., provides a society / an individual with a clear myth or a legend. This way one calms down the society, irritated by inexplicable, incomprehensible information, breaking into own inner world, and shaking the life foundations and established landmarks. One provides very simple

replies to complex questions. One creates a «miracle» that makes our lives comfortable and carefree.

I'll try to answer two important questions followed from the above: who needs it, and how such a «dark» society might advance technologically or progress at all?

The former question has a ready reply: there is always someone who pretends to be a leader in any group, starting from monogamous families, with all the privileges of that status attached. (You've heard a lot a sacramental phrase: «Who's the boss here?!»). The larger a social stratum, the greater is temptation and necessity of its leader to manipulate it, or precisely, to control its public consciousness.

The latter question is more complex: the given communication originally vests new information in the «mythical, miraculous clothes». The new knowledge takes shape of a «miracle.» (We do not consider here the Gebbels's propaganda, when the Nazi communication from the start employed a known technique: «The monstrous lie, the easier to believe it».) Examples of developed religious system like Christianity and Buddhism could illustrate my saying. They are based on the concept of a «miracle» and the ability of «miracle-making». At that, for centuries the religions exist in the most successful, in terms of progress, developed countries.

Another example is from the Conquista period when the Spaniards led by F. Pizarro, landed on the Peruvian coast on horseback in dozens, in shining knight armor, and were able to quickly subdue a large and powerful empire of the Incas only because the latter had never before seen horses and took the riders for own supreme gods descending from heavens and creating the «miracle». This communication mistake costed the Incas tons of looted gold and the mass genocide of the people. I'd like to note, that the holy faith in own «miracles-creating gods» did not slow down the progress in development of the Inca state, but helped to build amazing cities such as Machu Picchu, to draw huge gelioglyphs (the figure and the «lines» in the Nazca desert), to build huge temples and pyramids out of perfectly fitted multi-ton blocks. However, isolation of the Incas high in the mountain valleys and the limited communication channels, and hence, reduced arrival of technological know-how (no use of wheels), eventually played an evil joke and significantly inhibited development of their society, almost decayed from within by the time of the Spanish conquest.

The walls of the great temples of the Khmer and Thai vat-temples often contain a depicted man's figure with the shown «wonderful» acupuncture points, pressing which in certain order may heal this or that disease; it was a channel for transmission of ancient medical knowledge carefully preserved for thousands of years from generation to generation of people.

Modern model of a communication channel

Modern media people: image-makers, advertisers, journalists, marketers, have long understood the ways of creating the communicative «miracles» and are using actively the magic of this technology to promote goods and services in a given market.

The classic communication channel has a cyclic structure as follows:

....> Sender> Encoding> «Message» > Decoding> Recipient>

>Response> Noise and Interference> Feedback> Sender> ...

We see that in the first link from a Sender to a Recipient the major role is played by the «message», or the information, which

is encoded by the Sender in one way and is decoded by Recipients in several different ways according to their individual levels of perception («perception error»), and for the same reason there are even more variants of the Message when Decoding the «message» (in theory, there are as many message variants as many person were involved in the communication, since each person perceives and decrypts the information in his/her own individual way).

The next line of the magic formula shows that the Recipient generates own response to the received message and forms own feedback to the Sender, according to own life experience, own level of intelligence, own system of life benchmarks, own mentality (which is ultimately the Noise and Interference). This response to the Sender's «message» is manifested in various forms and actions. Actually, the entire communication channel is arranged for the sake of response and feedback to the sender.

Key elements of the magical formula are: encoding, pre-designed response and feedback. The more accurate is encoding, the more unique will be decoding and the lower the levels of noise and interference. Further in the book, to simplify, I will refer to the word «message» in a sense of «encoding + message + decoding».

Because today we are surrounded by countless of different communication channels, competing for our most active response, it is important to learn how to select own «message» from the huge current of such «messages», every minute poured on our poor minds. To this effect, invented were many techniques and tricks in the fields of marketing, integrated marketing communications and market promotion of goods and services, which I'd rather leave without treatment; all of them are available in excess on the shelves with business literature in any of bookstores [Razumovskaya, 2009, p. 7-30; Beych, 2006; Kotler, 2000].

I'd only note that all these techniques, tricks, and other network marketing strategies can be reduced to a certain process, sometimes even to a sacred ritual which helps to enhance the effect from any impact of a communication channel, or precisely, to a communication «message». Probability of a desired communication «miracle» directly depends on the extent of its creativity, emotional intensity and depth.

Thus, a thesis of the Marxist political economy, familiar to many Soviet people since their schooldays, about «the basis which determines the superstructure» or the Hegelian «the existence determines the consciousness» under the current conditions should look like this: «the «message» determines both the existence and consciousness».

From the foregoing, in regard to modern global communication systems, I'd like to note the following conclusions useful for our further journey in the depths of history:

1. People have a physiological need to create communication channels between each other and between social strata.

2. Each new effective communication channel, as a rule, occurs on the base of an innovation, a new technology; only under this condition it becomes effective and efficient. (Examples: invention of writing, of a wheel, discovery of radio waves, invention of the worldwide web, cell phones).

3. Any informative communicative channel is based on a word (the verbal communication channel), an abstract sign (the writing), an image (the pictorial communication channel), and a sound (the musical communication channel). In fact, these are different forms of a «message» transmission.

4. Technologically advanced societies can afford to set up the communication channels, which combine functions of several such channels.

5. The global (external) communication systems (or communication channels) occur between distinct societies (states) and function on the base of the above listed communication systems, and also transmit information along with the goods and other possible objects of exchange, trade and export. Thus, the idea of an innovation, i.e., information about it, may spread together with the thing itself, manufactured thanks to this innovative idea.

6. Sometimes a «miraculous image of an innovative thing» can be transmitted over communication channels (information about the «miracle») without direct involvement of this very thing in the communication process. In this case, the image takes shapes, very distant from the original; due to multiple noises and disturbances, the communication effectiveness is significantly reduced. The «miracle» should always be supported by actions, a process, or some visible results.

7. Main functions of communication channels, to my opinion, include: transmission of new information, training and education, entertainment, establishing a certain public opinion in a society and beyond.

8. A developed system of communication channels in a society accelerates its technological progress, and, vice versa, limitations of the channels, self-isolation leads to stagnation, degradation, and increase of irrational, religious (mythological) impulses within the society.

However, a society always «finds» the right balance between the rational and the irrational, a kind of «status quo», which can exist in society quite a long time. I was always amazed by ability of the ancient to build temples, phenomenal by labor costs and fantastic by size, for example, in Luxor and Karnak of ancient Egypt, great Pyramids of Giza and of Aztec in Meso-America, the temples and cult cities of the Khmer in Cambodia, huge statues of Buddha in India, or the Great Chinese Wall visible from the space. What sort of effective communication channels had to be created in these societies, what «miracle» images and ideas had to be introduced to the mass consciousness of the people in order to achieve such magnificent and monumental structures! ■

Channels of communication in ancient times

How could work communication channels in antiquity, in absence of a present-day variety of information? It is obvious that communication channels were not so global and were based on mythological, irrational thinking, as we tend to think, of the ancients. It is proved by multitude of extant tales, myths and legends stored in any peoples' memory.

To influence tribesmen more effectively through such communication channels, a variety of rituals, sacrifices, rites and taboo systems were formed. This hierarchy of rules and regulations soon becomes very complex and unwieldy, pressing the society to keep a great number of priests and other specially trained people to maintain the functioning of the complex «zombie-making» system.

Modern communication channels do not require any renovations and retrospectives and develop in a search for the most effective impact ways on target audiences, while the ancient channels need to reconstruct the features of the «message» creation, ways and peculiarities of its encoding, and also to reconstruct methods of influence on the ancient «audience» – to identify prevailing at the time trends, traditions, innovations, as well as the «tools»: rituals, ceremonies and other processes and methods to ensure the effectiveness of this ancient communication.

Primitive communication channels are known around the world. The most common are mnemonic «records»: counting sticks with notches to count the cattle, number of which corresponds to number of livestock in the care of a shepherd. Another communication system is represented by beads, each of them reminding a certain prayer. A more complex system is the knotted «kipu» letter of the Incas of Peru, whose signs are the cords and knots of different colors and lengths. Indian «wampum» belts, consisting of cords with strung sea shells and often woven into belts, served as money, decoration and a communication means to send a message made of a color, their mutual position and combination (an actual code). Examples of such systems are available in abundance in all nations of the world.

Perhaps, the most important communication problem, which ancient societies had to deal with, was the problem of self-identification, or own identity, expressed by the antithesis «own known vs. alien». Examples are: a special, symbolic code of dress, as recorded by ethnographers with many nations of the world; features of funeral rites that distinguish one society from another. The aggregate of these characteristics, together with artifacts from the tombs, as a rule, allows archaeologists to single out and identify numerous archaeological cultures. Noteworthy, what mattered for the ancient were external, visual, visible on the earth surface signs of «their» graves and cemeteries, but actually the invisible signs as well, hidden underground, but visible to the miracle-creating «own» gods of the worlds beyond this.

Interesting results in the reconstruction of female costumes based on the steppe Bronze Age monuments were obtained by Emma R. Usmanova [2010] who attempted

to reconstruct and decipher the symbolic code of Andronovo tribe dresses. The materials, drawn by the author, perfectly demonstrate development of the Andronovo «dress code» directly related to the social and physiological status of women in this society (Fig. 1).

Things around ancient nomads, no doubt, were linked with each other by a single narrative structure [Jacobson, 1988, p.223-229, Akishev, 1984]. The structure is most clearly manifested in the funeral rites, for example, in the Pazyryk barrows; the structure supported by written sources is in descriptions of the Scythian customs by Herodotus in the «History», or of the «frozen» tombs of the Berel and Ukok. However, these brilliant discoveries are too sporadic and uncommon delight for archaeologists. In most cases, existing archaeological methods do not permit fixing such narrative structures because the found items, due to their short life purpose, simply cannot be preserved in the ground.

On the other hand, when a man piles up grave stones and erects a funeral monument, he identifies himself and his identity to own clan, he certainly wants to express his feelings for the deceased, to preserve memory on him and do all befitting rites. Thus, a communicative message is being formed for different target groups: «I'm not alien» a message for the next world, «The grave of my kin is here» for the living, «Aliens are not present here» to outsiders.

There are plenty of evidence in favor of long-term existence of steppe burial mounds or fences: periodic new sub-burials into the same «own» grave in the Okunevo and Afanasievo monuments, in the Lchashen mounds; numerous extensions to the Andronovo fences, and also a grouping of much later works of the Catacomb cultures around the pit mounds, etc. All these facts allow us to consider each of these funerary complexes as a kind of an open-air temple for lasting rituals, the purpose of which we can only guess by remains of sacrificial food and memorial fires.

Archaeologists are regularly confronted with cases of apparent robbery of ancient tombs already in ancient times; obviously, it is not simply a way to «profit» at others' expense, but a conflict between communication systems, when an ancient communication system seeks to destroy all visible traces of an «alien» system.

Another obvious function of mounds: their use as landmarks when moving over long distances in the steppe. The mound chains indicate directions of these peculiar roads. Field studies and indications by ancient authors enabled to identify an inland communication network in ancient Scythia. It turned out that all the mounds of nobility were built near main communication paths. Remnants of the roads were fixed, and time needed for traveling them was calculated [Boltrik, 1990, p.30-44].

E. Jacobson, upon analysis of a degree of emotional and visual impact from funeral and pictorial monuments on ancient people, came to a conclusion that petroglyphs exhibit greater versatility in seeing life by the ancients, who, author believes, by all their essence, reject conservative and idealized traditions, predominant in the funeral rites [Jacobson, 2002, p. 46].

In a pre-literate period, ancient societies had to undergo a complicated way of experiments and failures until they have found the most universal variants of communicative channels, the most informative and clear signs. An example of an interesting symbolic communication channel is a system of the geometric ornaments found in numerous «Andronovo» vessels of the Bronze Age.

An ornamental tradition of decorating dishes is typical also to other synchronous archaeological cultures of the steppe zone

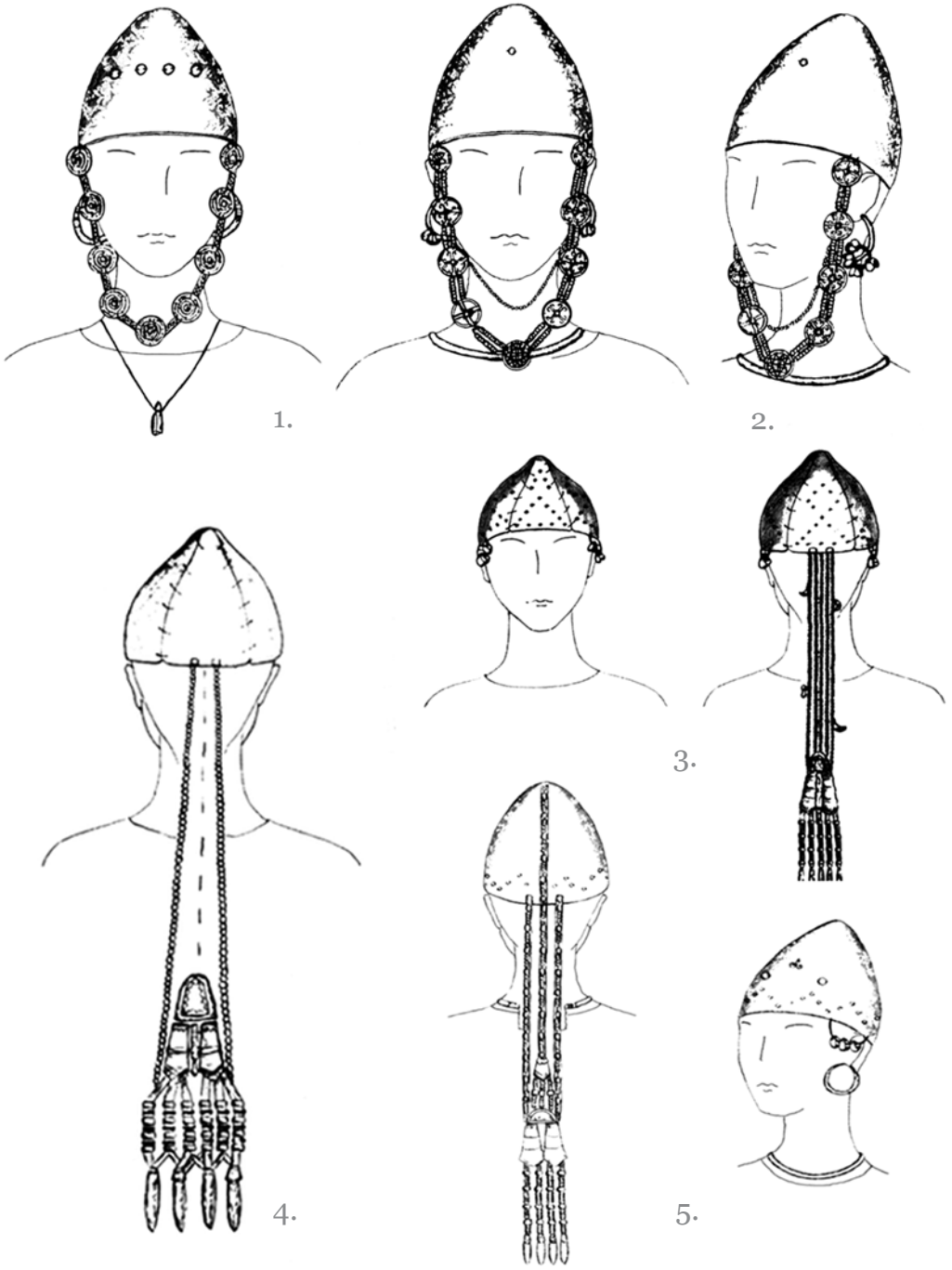
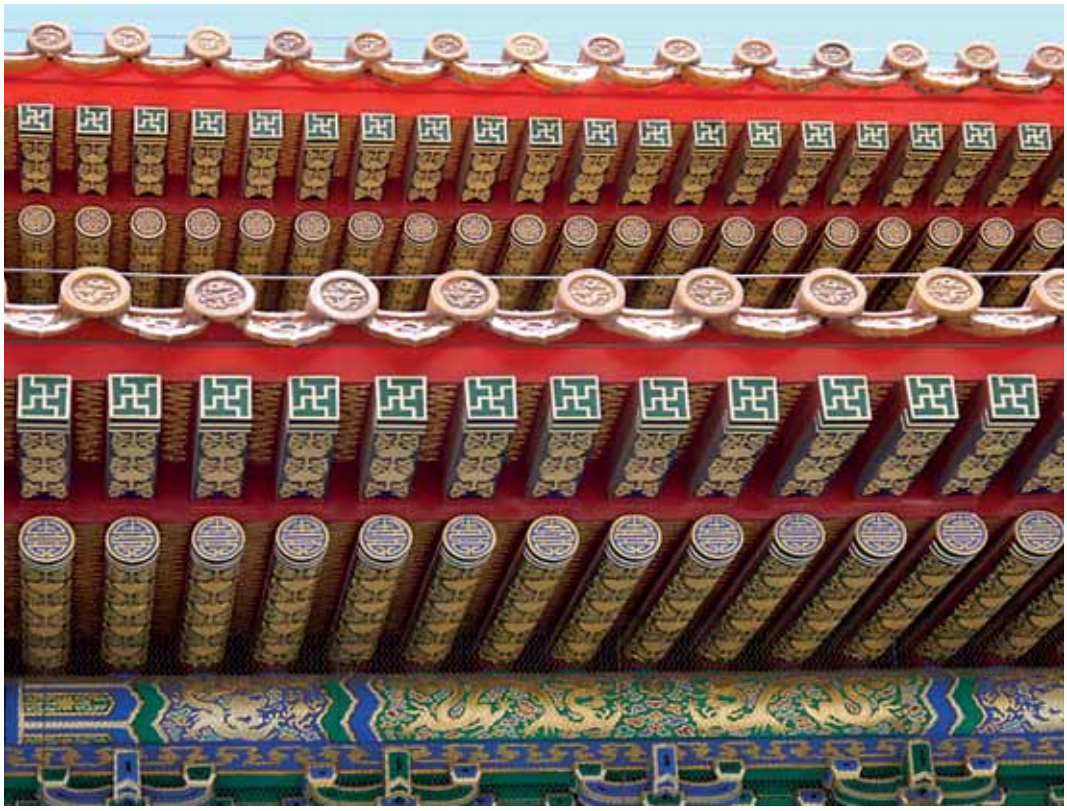


Fig. 1. Reconstruction of female Andronovo jewelry. [Usmanova, 2010, Fig. 25, 28, 37, 52, 61, 63.]. 1-Lisakovski 2, Barrow 1, burial, 1; 2 – Balykty, fence 14; 3 – Satan, Barrow 3, burial, 6; 4 – Bozengen, Barrow 9; 5 – Lisakovski 1, Group A, Barrow 1, burial 1.

of Eurasia. The communication channel is based on a combination of geometric sign, a triangle, with a meander and often a swastika on the bottom of a vessel. This communication works well on «a friend or a foe» antithesis [Usmanova, 2010, p. 87-89]. However, «the sign code» as «the message» of the communication still remains unclear. Noteworthy, such signs of the solar symbolism we faced later, at a considerable distance, in the most ancient monuments of India – Harappa and Mohenjodaro – and even in the exterior of the Chinese imperial palaces in the Forbidden City or in the Temple of Heaven.



Beijing. Forbidden City. The swastika in the design of the Imperial Palace.

Any script is based on a picture. All ancient writings of the East: Sumerian, Egyptian, Hittite, Chinese and other are pure pictogrammes. All these systems use outlines as characters, very remote from imaging of real objects, rather schematic or linear-geometric shapes. Numerous studies of primitive art show that «over the time drawings became schematized more and more until they had acquired forms which are impossible to recognize as an original image» [Gelb, 1982, p.37].

Writing is the most universal communication channel, because its characters – an alphabet or hieroglyphic syllabary – optimally solve the communicative task of recording, storing and transmitting various information and mythological knowledge accumulated by society. In other words, the writing is a system of mutual communication of people which conventionally utilize visible signs [Gelb, 1982, p. 23].

Etymology of the word «writing» in various Indo-European languages goes back to the verb «cut», «scratch out», «beat out», «draw with brush». A similar situation is observed with Semitic languages [Gelb, 1982, p.18].

Based on the above, crucial to this research is the study of petroglyph communication channel, namely, locations of petroglyphs already found in large quantities in various parts of Eurasia. The principal difference of petroglyphic sanctuaries as communication centers from other types of communication is that the «message» is not expressed through a syllable or a phonetic form, but was originally presented as a «miraculous mythological images» and their various combinations.

Obviously, these images reflect ethnical attribution of «friend or foe», like classic tamga-signs of nomads. Perhaps, for this reason, many petroglyphic sanctuaries also contain images of various characters: predominantly solar symbols, human feet, different tamga-like signs. Feature of such communication centers is also in the fact that they operate throughout different historical periods, at that, change of eras caused changes in a «message», but not communication channels themselves.

Pictorial monuments and sanctuaries in comparison with the burial structures are more holistic, meaning the survival of narrative structures, because they are less exposed to destructive impact of time. Petroglyphic communication channels are linked with each other by a single narrative idea both within a single plane and within general inner topography of the monuments.

These locations of petroglyphic sites have outstanding central 'altar' parts, which accumulated large multi-figured compositions (Fig. 2), and peripheral parts with usually less expressive single figures and separate scenes. This feature is fixed almost in every major petroglyphic monuments: in the Baikonur river valley, in close vicinity to steppe monuments of the Tamgaly gorge [Maksimova, Ermolaeva, Mariashev, 1985, p. 7-17], and in the Karatau range [Kadyrbaev, Mariashev, 1977, p. 202-203]. A similar situation is observed in a petroglyphic location of the Elangash river valley in Altay. [Okladnikov et al, 1979, p. 8-9], Mugur-Sargol at the Yenisei River, in the Minusinsk Depression [Devlet, 1980, p.10, Fig. 5, 6].

Another important feature of these communication centers is their fixed geographical location. There is considerable similarity of some of images among the Bronze Age petroglyphs in the vast territory of Eurasia. This may be due, on one hand, a common ideological ground of peoples who have left these monuments, and, on the other, due to mobility in space and time of agents themselves of the communicative tradition.

In the steppe zone of Kazakhstan, in Sary-Arka, accumulations of petroglyphs are located in the most notable places: on the rocky outcrops on tops and slopes of hills, the steep banks of rivulets drying up in summer. These points are visible from afar, are usually associated with stories and legends of local population, and are revered as «Aulie» sacred places. Traditional tribal festivals are held here by Kazakhs [Kadyrbaev, Mariashev, 1977, p. 202-203]. Such points also now serve to cattle-breeders as memorial signs for orientation in the steppe. Shepherds have a custom to pile up «obo» stones on top of hills; obo servs both cult purposes and also orientation in the steppe.

In antiquity, petroglyphic monuments might carry out also another useful communicative function, a sort of a «lighthouse» in vast expanses of the steppen «ocean», indicating the most convenient pastures and routes in mountain passes.

A similar point of view was expressed by P.M. Kozhin in relation to rock drawings of chariots, which he regards as a kind of road signs and distances marks [Kozhin, 1987, p.121]. This assumption has been challenged by E. A. Novgorodova. She noted: «It suffice at least once to climb the mountain Bichigtyn-am on a steep bank of the Chuluut river, the rocks on the Koksu river banks in Kazakhstan and, moreover, to overcome the crossing to the pass Kugart (Saimaly Tash – V.N.) to understand that there is no way for chariots ... «[Novgorodova, 1989, p. 164].

It is premature to talk about road marks on ancient communication ways; they still have to be fixed, but concerning the Saimaly-Tash petroglyphs, located at 3,000 m

asl, according to our field research of the monument, ten months per year the gorge on the way to the petroglyphs is covered with thick, smooth and highly durable snow crust, to climb which on a saddle horse, for example, is not difficult. No one insists to drive a chariot to these petroglyphs, it is sufficient to disassemble a cart and, if necessary, pack a saddle. Not surprisingly, the petroglyphs of Saimaly-Tash contain only light vehicles: carts on small disk wheels, and chariots; in one case only a 4-wheeled cart is shown with small wheels. There were no technical obstacles for ancient herders to cross the Kugart pass towards the fertile Fergana Valley.

Besides, Saimaly-Tash petroglyphs not only fix their stay here, but also witness certain rites and mythological beliefs associated with such advancement. Explicit two-layer stratigraphic petroglyphs of Saimaly-Tash Aeneolith and Bronze suggest lasting use of the pass as a transit point on the way from steppe regions of the continent to Central Asia and back.

Cultic significance of the pass remains to this day. Local herders consider the gorge as sacred, its grass as magical. According to their views, «miracles» occur in the valley, only breeding bulls should graze here. This confirms the importance of the Saimaly-Tash sanctuary as a regional communication center on the way to Central Asia since very long ago.

Recent publications contain many variants of understanding the nature of petroglyphic sanctuaries. Here are some of them, so that an interested reader can compare them independently.

Z.S.Samashev's treatment of the word «sanctuary» implies a long-term functioning of multi-component sacred centers of intense spiritual culture of human communities and, more specifically, a kind of open-air temples, where, thanks to availability of a set of revered objects: rocks suitable for drawings, water sources, sacrificial floors, rock crevices, caves, boulders and other types of sacred loci, – held were various religious-mystery actions, attributed to important events of a calendar or any other life cycle of certain societies, and related to their religious and mythological concepts [Samashev, 2006, p. 32].

A. Martynov thinks that «a primary role in establishing and functioning of a monument does not belongs to images but those specific environmental factors which make a place sacred and dedicated to ritual actions» [Martynov, 2005, p. 169].

V.I. Molodin and N.S. Ephremova explain the appearance of the Kucherla sanctuary in Altai by presence of a picturesque rocky niche, of a suitable floor for rituals and sacrificial offerings, as well as of a healing water source [Molodin, Ephremova, 2008, p. 76].

L.S. Marsadolov believes that most of the sanctuaries are associated with astronomical factors like sunrise or sunset of the sun and the moon, and also with surrounding mountains [Marsadolov, 2007, p. 203].

T. M. Potemkina upon analyzing a row of monuments of Aeneolith-Bronze Age in the Ob-Irtysh area suggests possible associations of astronomical principles with the circular plan of the ancient temples [Potemkina, 2007, p. 197-223].

I. D. Rusakova distinguishes three types: sanctuaries, guard posts (observation posts) and «rock-books», or information centers. She suggests calling a site «sanctuary» if it is characterized by the following features:

- convenient access to the monument;
- smooth surface of a large size;
- a large number of drawings;
- drawings are integrated into one or more compositions;
- the plane is visible from the valley;

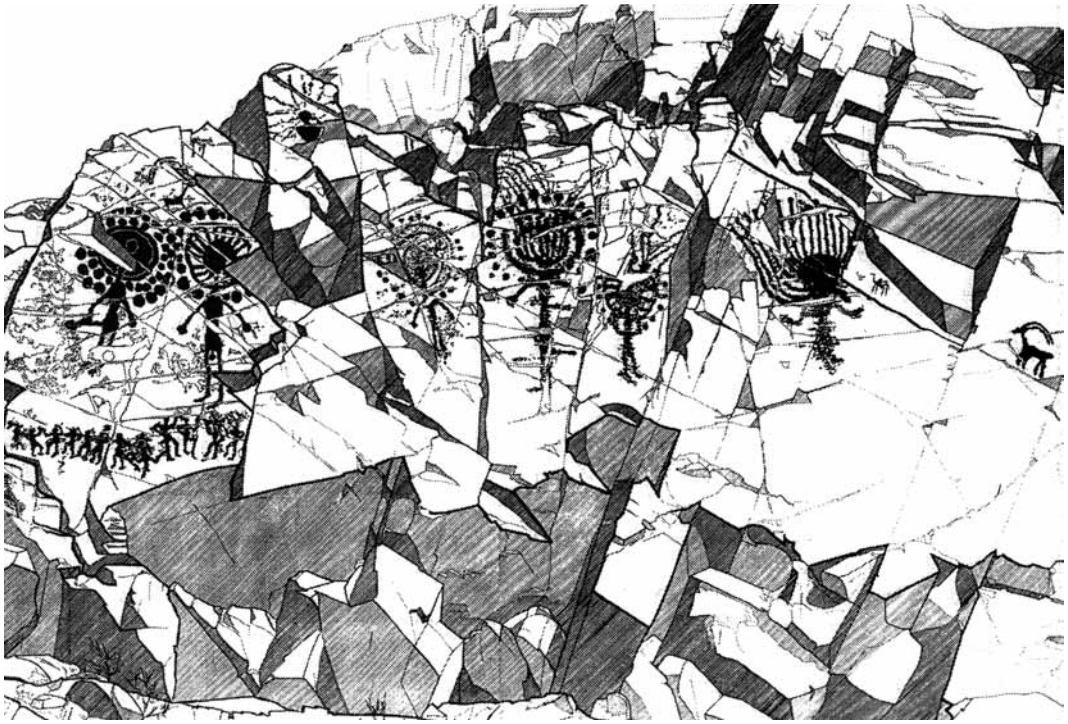


Fig. 2. The altar of the sanctuary Tamgaly [Rogozhinskiy, 2001].

• a floor before the plane, which may accommodate up to several dozen of people;

• the valley is visible from the floor in front of the plane [Rusakov, 2001, p. 74-75].

A.E. Rogozhinskiy develops a similar concept, based on many years of research of the famous Tamgaly sanctuary [2001, p. 7-44, 2002, p. 12-20, 2011a].

As we can see, the above views agree with the concept of sanctuary as a communication center of ancient societies. Interestingly, in the Avesta Hymn to Anahita (Ardvi Sura), patroness of cattle, it is noted that sacrifices and worship rituals should be conducted on a shore of a water body or in the mountains [Avesta, Yasht 5]. It is exactly these areas of Eurasia where concentrations of petroglyphs were detected, although, according to the mythology, Anahita's important attribute is a chariot.

Another important feature of these ancient pastoralist communication centers is that «messages» and communication images themselves evolved on a single «miraculous» mythological basis, derived from a traditional way of the economy and the «mytho-poetic», as noted by O. Abayev, nature of perception of the surrounding world by ancient shepherds [Abayev, 1990, p .15].

Stages of this evolution are fixed by obvious iconographic and stylistic changes in images. It hardly was a steadily advancing progress. There have been, obviously, attempts to employ different signs, symbols, including ornamental ones. The most informative, significant and universal images we find later in the literature of different nations (Fig. 3).

For example, the standard image of a chariot in plan projection, characteristic to Bronze Age petroglyphs of Central Asia, has become a character in the ancient Chinese writing system, and «figurative» perception of the world for a long time «settled» since then in the mysterious Chinese mentality.

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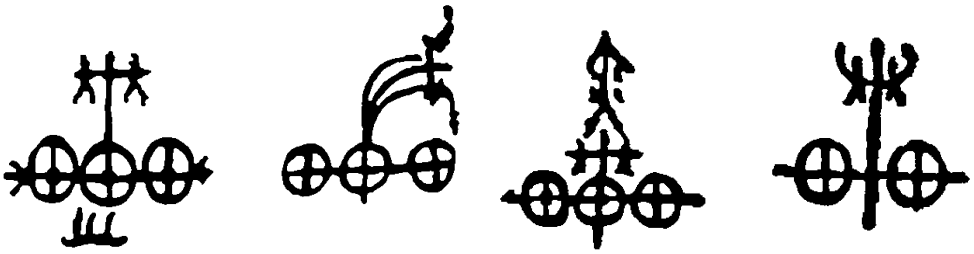

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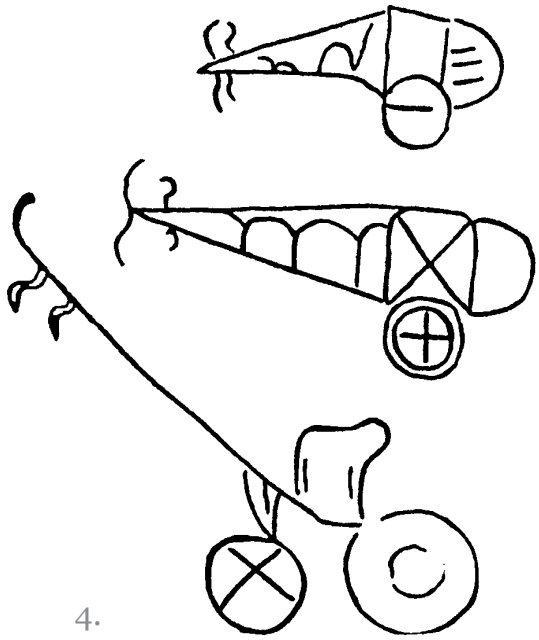

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Fig 3. 1-2 – pictograms of Uruk IVa [Burmeister, 2004, abb.5; Littauer, Crouwel, 1979, abb. 1], 3 – patterns of ancient Chinese characters, 4 – linear letter «B»[Sher, 1980; Novgorodova, 1984; Cherednichenko, 1976, Fig.10].

Profile image of 2-wheeled cart became a stylized sign in the ancient Crete writing (linear script B), and the Sumerian pictograms on clay tablets with images of ancient chariots represent a valuable and unique source on development in the most ancient period of transport communications and invention of the wheel – one of the most important innovations of the Old World.

From the above we derive prospects of a more detailed study of petroglyphic sanctuaries, as communication centers, safely fixing on the map of Eurasia the communication points of ancient population, while spatial spread of similar and well-dated images can show paths and directions of migration of ancient tribes throughout the Eurasian continent. ■

To the problem of reconstruction of the ancient communications

In the process of formation of external communication channels, an extremely important role belongs to an object of a communication channel, in other words, the cause for creating a channel. As a rule, these are innovative objects or objects that may be lacking in the actual life of society, or they cannot be made because of insufficiently developed knowledge, skills and lack of appropriate technologies or necessary raw materials.

In order to obtain such important commodities, ancient societies at the dawn of their existence, were building up very considerably extended, even by modern standards, exchange channels.

The classic example is the Great Silk Road, a transcontinental transport corridor between Europe and China, linking geographically, culturally and technologically very distant areas. The focus of this communication channel was placed on Chinese miraculous inventions of silk production, forbidden to other nations, porcelain, gunpowder, paper, as well as spices. Moreover, a search for most convenient ways to China by land or sea has led Europeans to the geographical discoveries of new «worlds» and whole continents. Noteworthy, development of such a transcontinental road in early Middle Ages naturally employed the geographical and astronomical knowledge in store and the ideas about population traditionally inhabiting the area along the route.

Consequently, for analysis and reconstruction of ancient «pre-silk road» communication systems in the vast expanses of Eurasia, of a paramount importance is search of such exchange objects and prevalent natural «monopolies» on a given product, technology or innovation which took place in areas of discovered and fixed artifacts and archaeological cultures.

With regard to the ancient steppe pastoralists communities, there is own specificity: unlike the classical exchange schemes in a sedentary agriculture-oriented society which builds a geographically fixed map of its communications with other communities, the mobile communities, oriented to cattle-breeding, form up a «mobile» map of external and mobile communications, which is difficult to fix due to both the specificity of this economy / way of life, and the lack of a sufficient amount of sources to document the process.

Important for understanding the ancient stepp's internal communications is almost «legendary» phenomenon of «uzun kulak», a verbal communication system between shepherds, preserved with Kazakhs until the Ethnographic times. The system provided rapid dissemination of news across significant distances and maintained an effective information exchange between distant producing collectives. Above all, the system quickly responded to emerging «strangers», as per the «friend or foe» scheme.

In general, in preliterate period, an archaeological culture in relation to mobile pastoralists is a concept rather conditional, an attribute of the archaeologists' professional lexicon and reflects peculiarity of mass artifacts of material culture: pottery and its ornaments, craft items, weaponry, the hunting, burial rites specific to certain territory (ecological niche).

In other words, any archaeological culture, identified in the steppe regions, due to its natural limitations and small number of other sources of information, captures only an insignificant part of artifacts survived to our days in the ancient tombs and rare settlements. The total amount of information obtained about real life of ancient societies, due to these limitations is greatly reduced. Employing new natural-science research methods (e.g., paleogenetic level), geographic expansion of field works, attracting professionals from adjacent fields of science would increase it. For example, a recent paleogenetic study of the ancient population of the Ob steppe suddenly revealed significantly more intense, than it was previously thought, contacts and migrations by local people and ancient societies inhabiting the territory of neighboring Kazakhstan [Molodin, Pilipenko et al, 2011, p. 88-93].

Study of already opened complexes of archaeological culture artifacts through the lens of societies' communications is a promising occupation. By focusing on obvious innovations in the economic activities of the communities, mapping them in space and determining their coordinates in time, reconstructing their communications, we can certainly reach a new level of our knowledge. All the more so that the way of life of these people, initially doomed to constant movement, was oriented to eternal search of new pastures, the eternal search for the wonderful «promised land» or Aryan expanse, Ayryanam Vaydzha, known in the ancient Indo-Iranian tradition [Masson, 1999, p.72-74].

Perhaps, someday the concept of «archaeological culture» will be replaced by the concept of «archaeological traditions», fixing the most stable technological skills and techniques of ancient societies; novations and related communication channels, reflecting the dynamics of development of societies across time and space.

Works by G. Kossinna [Kossinna G., 1921] and his followers for a long time discredited migration theories in the historiography, for political reasons, but in specialized literature there are theoretical developments, determining types and nature of migrations [Titov, 1982, p. 89-145, 1988, p. 47-123; Klejn, 1974, p. 7-55; Olhovsky, 1992, p. 30-33, Gumilev, 2007 and others].

I totally agree with the idea that convergent, autochthonous development and migration, as historical phenomena, cannot oppose each other [Dyakonov, 1989, p. 5-21].

When reconstructing ancient communications, an item from «alien» culture found in an archaeological complex, cannot be a sufficiently reliable indicator of ethno-cultural contacts and their orientation, and even more so, of migrations, because conditions of its appearance remain unknown: either it came as a result of trade exchanges, marriage and family relations, or robbing of foreign tombs, etc.

«Transcultural» traditional irrational features in the archaeological cultures of the steppe are most close to ethnic background of ancient societies. In a narrow sense, these are artifacts, definitely connected to cultic activities; in a wide sense, these are features of funeral rites, pictorial tradition, some of the technological skills (casting bronze objects in forms, making cart details, ability to tame a horse, etc.). In one way or another, these activities are associated with rituals reflecting some mythological views (wider: cultural, meaning an ideological sense). The indicated features are, as a rule, considered regionally, in terms of convergent development and in respect to separate archaeological cultures.

It is obvious that analysis of such «transcultural» things and phenomena and their mapping will change the situation. Their study in conjunction with data from lin-

guistics, anthropology, mythology, paleozoology, paleodemography and ancient climate, with results from computer simulation and natural sciences: DNA analysis, mass calibrated carbon datings and other, may increase reliability of future historical reconstructions.

It seems that the fact of external communication and of possible migration of a society, as its integral part, takes place when:

• there is an object which stimulates a migration: new pasture for cattle, search for raw materials of pottery production, goods from bone and metals, etc.;

• technical facilities widely used in daily practice:

- vehicles, which allow implementing such a move, and themselves represent a technological innovation, combined with an appropriate set of things and explicit achievements in the process of domestication of draft or saddle animals;

- A set of innovative weapons and of appropriate skills, superior in efficiency to existing systems;

• Migration is a consequence of a certain trend of historical development, and present is a set of internal and external causes contributing to it (population growth, increased livestock numbers);

• There are «extraterrestrial» (or «foreign») and «transcultural» novations and explicit fragments of similar funeral rites;

• Similar anthropological type of population;

• A communication «message» is defined: features of burial rites, essential elements of mythological concepts, as well as pictorial figurative images and stories and their combinations.

The above listed migration attributes can easily be formalized and can be represented in quantitative values under a complex analysis of steppe archaeological cultures, when assessing their ability and readiness to this type of communication.

A natural-geographical factor is decisive in the process of migration itself in the steppe. Availability of water and of sufficient food for domestic animals determines a «mechanism» for mastering of new virgin steppe spaces: along shorelines and basins of multiple rivulets, abundant in the area.

Such reflections identified a main object of this study: the «miracle» of wheel carriages, as innovations, imprinted in petroglyphs, and spread of the «miraculous» invention all over the vast expanses of Eurasia at the end of 4th to 1st millennia BC. But this introduction would be incomplete without an attempt to answer the following important question. ■

How to decipher the «message»?

More than one generation of talented scientists devoted their research studies to this search. By the end of 1950s in France, two approaches developed for explaining the meaning of Paleolithic Art. A. Braille and his followers advocated evolutionary and comparative concepts; they have collected and systematized all materials known by the time. This important work created a necessary fund for further researches.

A. Laming-Emperer and A. Leroi-Gourhan in their works formulated a different approach, based on refusal of any explanations of the Paleolithic art content, which does not follow from the material itself, i.e., refusal from sources, external to the art [Laming- Emperaire, 1969, 1962; Leroi-Gourhan, 1964, 1964-1965]. A main objective of the study, according to this concept, should be a search for inner laws of placing the figures on a plane, their alternation, compatibility of different images. An ethnographic comparativism is rejected as a technique for reconstruction of image semantics.

The concept that the rock art is a communicative system, that stone images are created by certain rules of «grammar», and that establishment and development of these regularities will give a clue for reading of the information encoded in «rock texts», – this concept relates to principles of structural methodology of Levi-Strauss.

The system is based on a «text», which operates with images/symbols; the latter have both own meaning hidden from us and own inner structure with a logic of arrangement on rocks as compositions/scenes; there is an inner relationship between compositions/scenes and their location sequence in the sanctuary – «a pictographic series» – which, in turn, has its own rules of location, position and inner inter-relations with other «texts» and «pictographic series« of the petroglyphic site.

Consequently, the true meaning of the «message» can be seen by examining these inner rules/relationships and features of an ancient worldview system and their cultural and historical environment.

The process's complexity lies in the fact that it is necessary to «translate from the language of visual images into the language of verbal communications» [Sher, 1980, p. 257-258]. This is not always happens correctly: often, behind same images and their combinations may stand very different code systems, resulting in different content conveyed by visually similar texts [Rajewski, 1999, p.121].

In his studies, J. A. Sher develops a concept of ritual and mythological modeling systems [Sher, 1980, p. 259-287]. Pictorial monuments are considered as one of many elements of ritual and mythological activity of ancient people. According to the concept, along with individuation of certain recurring themes in the pictorial

monuments of Central Asia, it is permissible to compare them with known ancient mythological representations described in the most ancient written sources.

Many researchers widely utilize the method of comparison with some ethnographic rituals and systems for semantic interpretations of petroglyphs [Devlet, 1980, 1982, Novgorodova, 1984, 1989]. Of particular interest is the attempt to compare the Karatau Range compositions containing chariot images with myths of the Rigveda and the Avesta [Kadyrbaev, Mariashev, 1977, .202-220]. Important «readings» of petroglyphs were made in a series of works dedicated to rock drawings of Siberia, Mongolia and Altai [Okladnikov etc.,1971-1980; Okladnikov Martynov, 1972 and others].

By the end of the last millennium, a substantial body of petroglyphs of eastern part of Eurasia was accumulated; many new locations were discovered and described. An international multi-volume edition of «The corps of petroglyphs of Central Asia», edited by J. A. Sher and H.-P. Frankfort was launched under the auspices of the UNESCO, which includes the brightest, new and well-documented famous monuments. An extensive informational petroglyphic database was formed in different regions of Eurasia; two conceptual approaches were developed to deciphering the meaning of rock images, «mythical» and «magic», or ethnographical.

Indo-European myths, cosmogony, and, in particular, the Vedic and Indo-Iranian myth-creating tradition are well-fit in the «pictorial series» of many petroglyphs of eastern Eurasia. This is reflected in brilliant studies by V.V.Ivanov, V.N. Toporov, Lotman, J. S. Rajewski and many other researchers, and very brightly shown in a series of works by E.E. Kuzmina. [Kuzmina, 1994, 1995, p. 37-38, 2000, 2008, 2010].

Proponents of the «magic» concept, basically, representatives of the Siberian school of archeology, utilize numerous ethnographic examples and shamanistic rituals for decrypting the petroglyphic content.

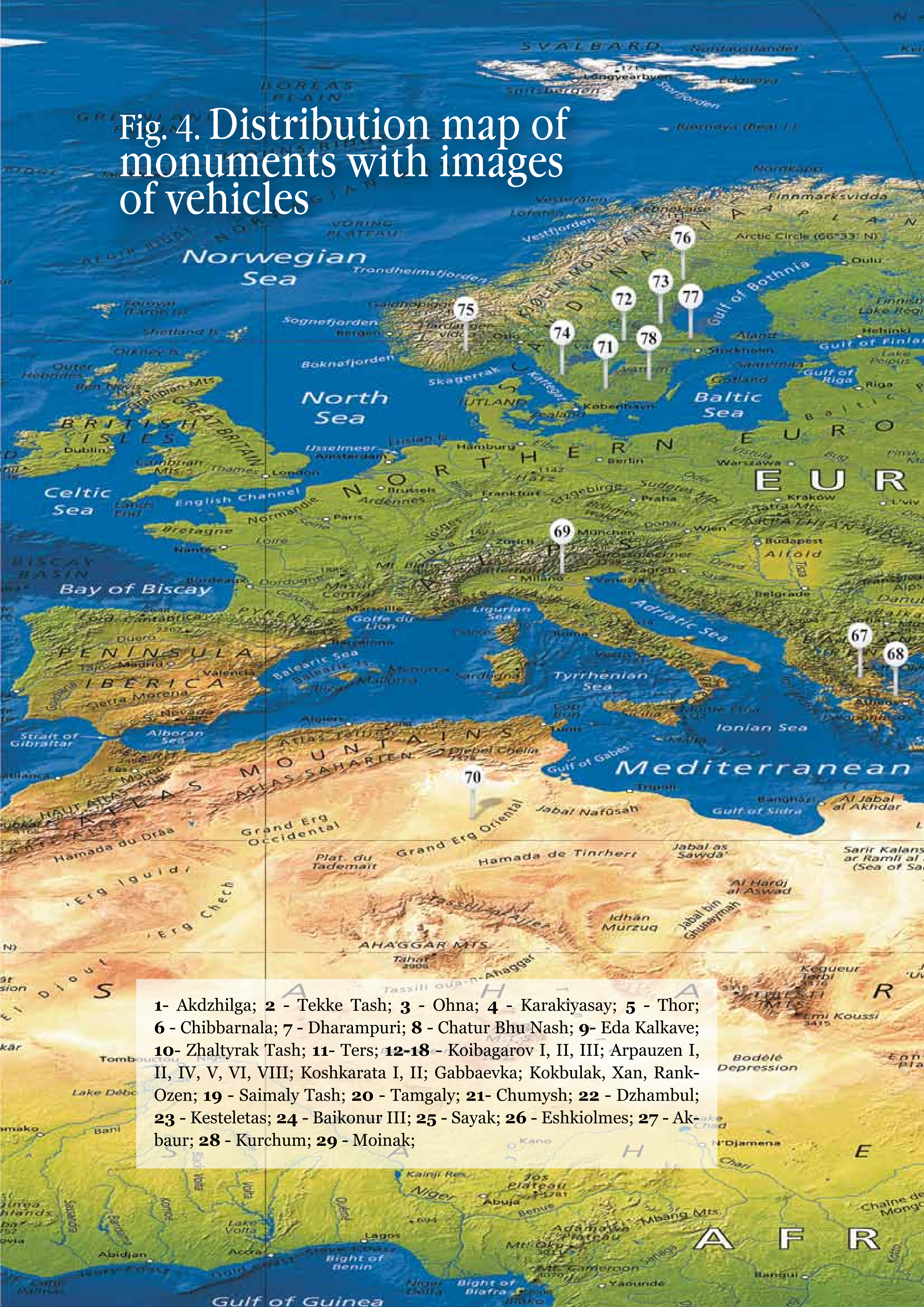
There are also «compromise» opinions saying that opposition of semiotics to historical semantics for interpretations is unacceptable, because they reveal different bases of the same phenomena, as reflected in images [Studzitskaya, 2004, p. 245].

Thus, by the start of new millennium, a huge body of materials was accumulated, but, having all the significant achievements in the matter, full valid decryption of the «message» of ancients did not happen, neither a new qualitative leap in our ideas and knowledge about ancient societies of Eurasia.

Therefore, a very sharp article by H.-P. Frankfort and E. Jacobson [2004, p. 66 -76] appeared naturally; it criticized petroglyphs as an historical source, because it is impossible to have their complete decoding.

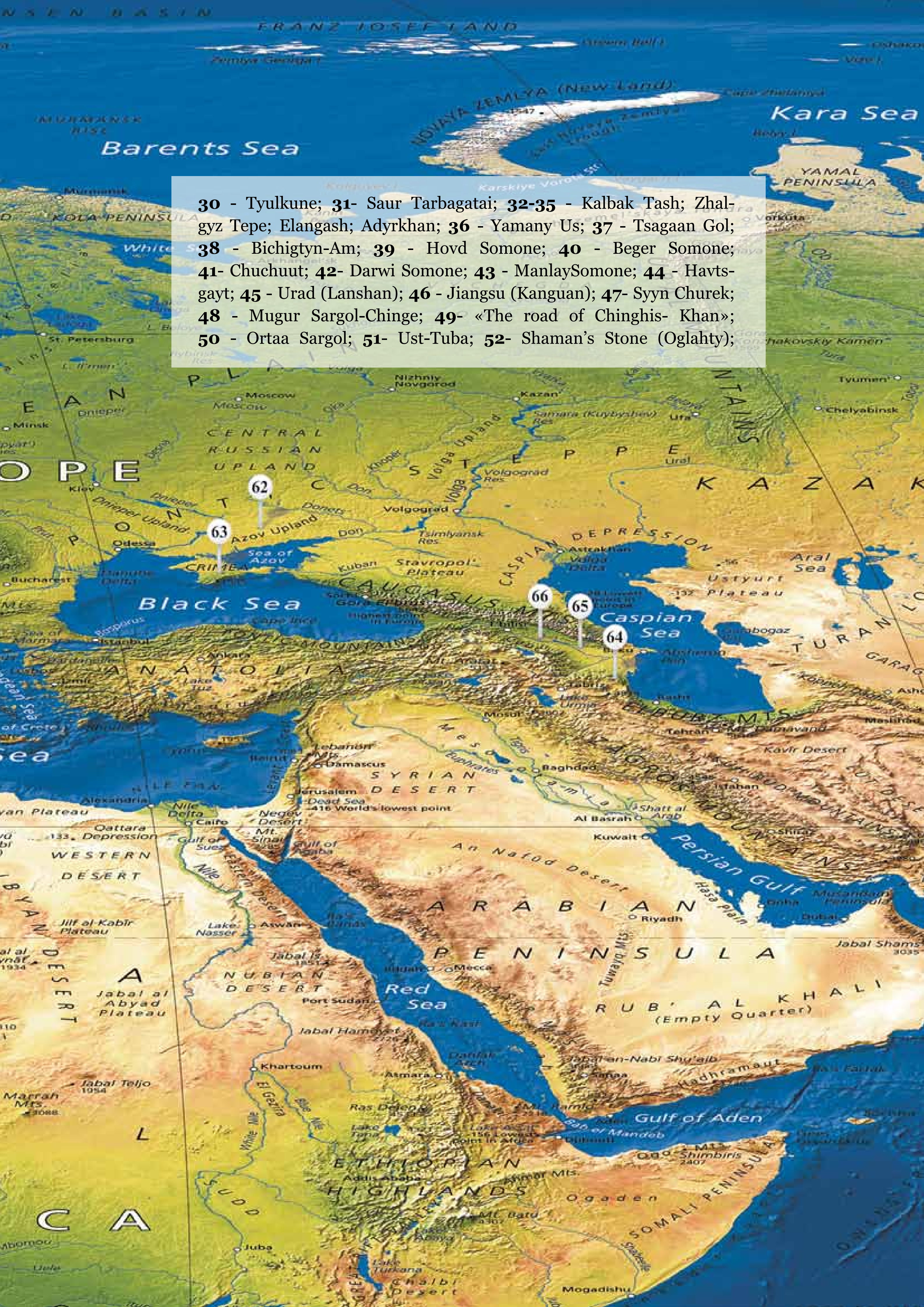
As a way out of the impasse, they proposed a thesis that «the study of petroglyphs lies somewhere between science and art», and that for experts in the analysis and classification of rock art now is high time to address its aesthetic aspects; they opposed the use of ethnography and mythology data in reconstructions, suggesting that many expectations in this regard were not justified and that «both approaches – shamanic and mythological – suggest the perception of petroglyphs as an illustration of a written/oral sources»; they suggested an alternative detailed consideration of issues related to «social substantive aspects of rock art, in particular, with reflection of kin connections in a society»; they called investigators to pay more attention to petroglyphs of an imperial periphery of settled civilizations in the ancient and medieval times, where an inner impulse arises and is picked up by

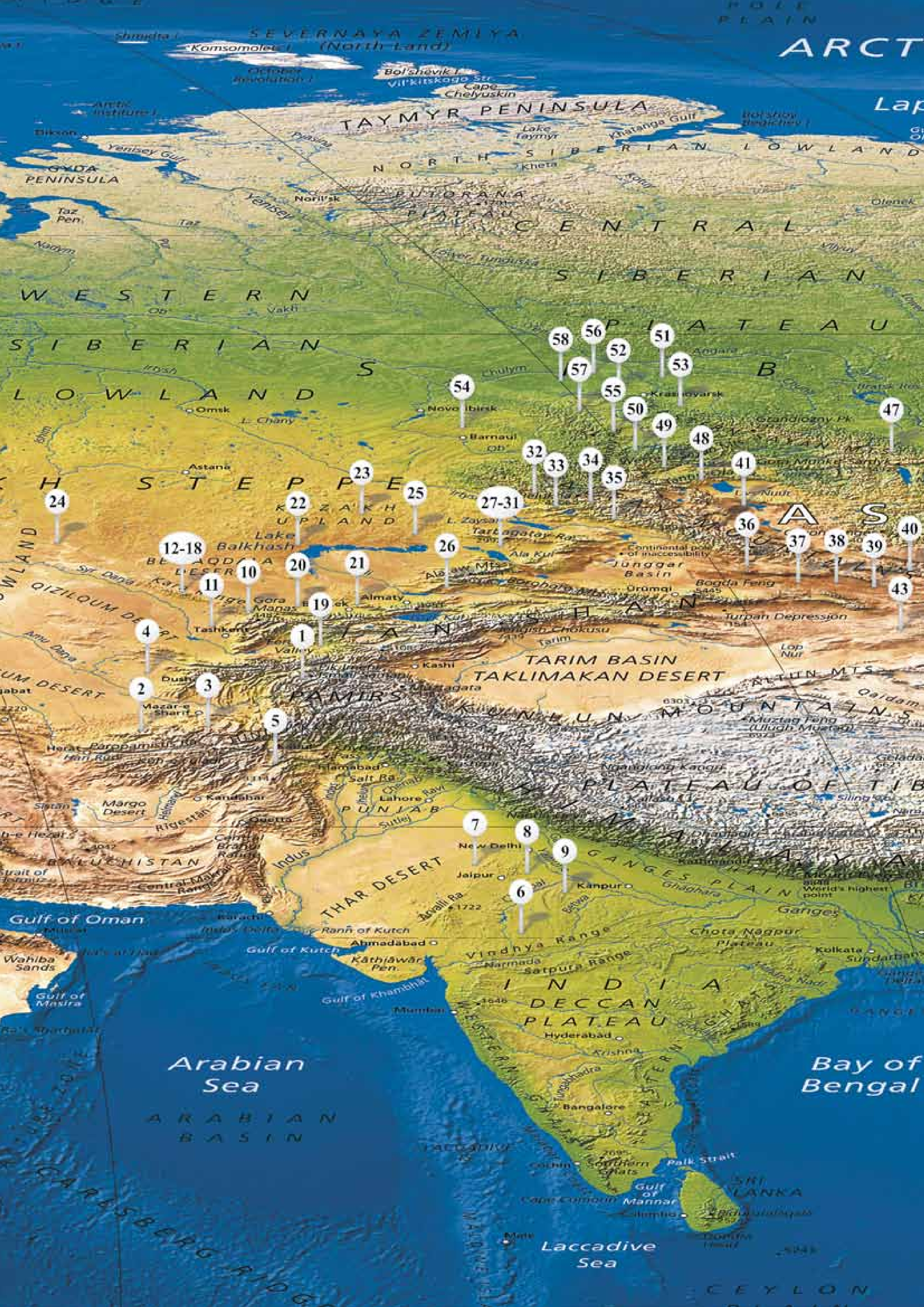
Fig. 4. Distribution map of monuments with images of vehicles



1- Akdzhilga; **2** - Tekke Tash; **3** - Ohna; **4** - Karakiyasay; **5** - Thor; **6** - Chibbarnala; **7** - Dharampuri; **8** - Chatur Bhu Nash; **9**- Eda Kalkave; **10**- Zhaltyrak Tash; **11**- Ters; **12-18** - Koibagarov I, II, III; Arpauzen I, II, IV, V, VI, VIII; Koshkarata I, II; Gabbaevka; Kokbulak, Xan, Rank-Ozen; **19** - Saimaly Tash; **20** - Tamgaly; **21**- Chumysh; **22** - Dzhambul; **23** - Kesteletas; **24** - Baikonur III; **25** - Sayak; **26** - Eshkiolmes; **27** - Ak-baur; **28** - Kurchum; **29** - Moinak;

30 - Tyulkune; **31**- Saur Tarbagatai; **32-35** - Kalbak Tash; Zhalgyz Tepe; Elangash; Adyrkhan; **36** - Yamany Us; **37** - Tsagaan Gol; **38** - Bichigtyn-Am; **39** - Hovd Somone; **40** - Beger Somone; **41**- Chuchuut; **42**- Darwi Somone; **43** - ManlaySomone; **44** - Havtsgayt; **45** - Urad (Lanshan); **46** - Jiangsu (Kanguan); **47**- Syyn Churek; **48** - Mugur Sargol-Chinge; **49**- «The road of Chinghis- Khan»; **50** - Ortaa Sargol; **51**- Ust-Tuba; **52**- Shaman's Stone (Oglahty);




SEVERNAYA ZEMLYA
(North Land)
Komsomolets I.
October Revolution I.
Bol'shevik I.
Vil'kitskogo Str.
Cape Chelyuskin
ARCT
Arctic Institute I.
TAYMYR PENINSULA
Lake Taymyr
Khatanga Gulf
Bol'shoy Begichev I.
Dikson
Yenisey Gulf
GYDA PENINSULA
NORTH SIBERIAN LOWLAND
Kheta
Noril'sk
PUTORANA PLATEAU
Yenisey
Taz Pen.
Taz
Nadym
Olenek
CENTRAL
SIBERIAN
PLATEAU
Lower Tunguska
WESTERN
SIBERIAN
LOWLAND
Ob'
Vakh
Irtysh
Omsk
L. Chany
Chulym
Novosibirsk
Barnaul
Krasnoyarsk
Angara
Astana
STEPPE
KAZAKH UPLAND
Lake Balkhash
L. Zaysan
Tarbagatay Ra.
Ala Kul
Continental pole of inaccessibility
Junggar Basin
Ürümqi
Bogda Feng
Turpan Depression
Lop Nur
Syr Darya
QIZILQUM DESERT
Amu Darya
Tashkent
Almaty
Kashi
TARIM BASIN
TAKLIMAKAN DESERT
ALTUN MTS.
PAMIRS
KUNLUN MOUNTAINS
Muztag Feng (Ulugh Muztagh)
PLATEAU OF TIBET
Herat
Hari Rud
Kandahar
Sistan
Margo Desert
Registan
Quetta
BALUCHISTAN
Islamabad
Salt Ra.
Lahore
PUNJAB
Sutlej
Indus
New Delhi
Jaipur
Kanpur
GANGES PLAIN
Ganges
Kathmandu
World's highest point
THAR DESERT
Aravalli Ra.
Rann of Kutch
Gulf of Kutch
Karachi
Ahmadabad
Kathiawar Pen.
Gulf of Khambhat
Mumbai
Vindhya Range
Narmada
Satpura Range
Chota Nagpur Plateau
Kolkata
INDIA
DECCAN
PLATEAU
Hyderabad
Krishna
Bangalore
Gulf of Oman
Wahiba Sands
Gulf of Masira
Arabian Sea
ARABIAN BASIN
Bay of Bengal
Cochin
Cape Comorin
Palk Strait
Gulf of Mannar
Colombo
SRI LANKA
Laccadive Sea
Male
CEYLON
1 2 3 4 5 6 7 8 9 10 11 12-18 19 20 21 22 23 24 25 26 27-31 32 33 34 35 36 37 38 39 40 41 43 47 48 49 50 51 52 53 54 55 56 57 58

53 - Suhaniha II; **54** -Mountain Tunchuh; **55** - Oshkolskaya Pisanitsa; **56** - Sadlovina Mountain; **57**- Shishka Mountain; **58** - Polosataya (Striped) Mountain; **59** - Mountain Suleek; **60** - Chanaa-Shuluun; **61**- Tabangutskoe Obo; **62** - Kamennaya Mogila; **63** - Tash-Air; **64** - Gubustan ; **65** - Gamigaya; **66** - Syunik; **67** - Kavala; **68** - Mycenae; **69** - Val Camonica; **70** - Tassili'n'Andjer; **71** - Frennarp; **72** - Bottna; **73** - Svennebi; **74** - Kville; **75** - Ostfold; **76** - Bohuslan; **77**- Simris; **78** - Ostergotland.

the peripheral steppe world, enriching it by artistic images, while a possible feedback from the «steppe art» in developing some artistic traditions of the empire should be recognized. [Frankfort, Jacobson, 2004, p. 68-69].

The article aroused stormy debates and discussions, attended by leading experts [Vishnyatsky, 2005, p. 51-54; Bednarik, 2004, p. 45; Molodin, 2004, p. 51; Sovetova, 2006, p. 80-93, 2007, p. 103-104; Shvets, 2005, p. 130-139, and others].

In recent years, interesting theoretical and methodological studies appeared on new aspects of study of ancient pictorial activity: on identification and detailed analysis of a structure and principles of compositional construction of petroglyphs [Podolsky, 2004, p. 13-16], on some universal decoding keys of semantics of petroglyphs [Tivanenko, 2005, p. 247-249].

I.V. Kalinina believes that historical semantics, which studies meanings of archaic images, systems of their interrelationships, is opposed to semiotics, which studies signs in life of a society, studies cultural phenomena as texts, identifies an image as a unit of analysis and raises a question on historical correlation of images and concepts, pointing to their discrepancies in system-forming foundations. To describe images, she suggests to use a term a «semantic function», according to which she distinguishes several types of images [Kalinina, 1999, s.207-208].

J.C. Garden, in regard to interpretation of petroglyphs, calls to use achievements of the most different, sometimes coexisting, scientific schools and directions of thought [2006, p. 86-95].

As we see, there is still no clear answer to the question stated in the beginning of the section.

The ongoing debate includes somehow aspects of study of vehicle images in petroglyphs, as one of the most informative and relatively well-dated image.■

The cart image in the petroglyphs of Eastern Eurasia

Among the huge diversity of the petroglyphic world of eastern, Asian part of the continent, with more than three hundred well-known pictorial monuments, amazing images of carts are eminent for their beauty and originality. Compositions with carts strike our imagination.

More than 450 such images have been published in the various editions (Fig. 4). The most complete register of such monuments is shown in the studies of J.A. Scher [1980, p. 79-170] and P. Kozhin [1987, p.109-126, 1988].

A large number of vehicle petroglyphic images were published by Okladnikov and members of his expedition in a series of works devoted to petroglyphs of the Mountainous Altai [Okladnikov et al, 1979, 1980, 1981, 1982, 1985; Kubarev, 1990, p. 154-156; Okladnikova, 1990].

Fig. 7. Karatau ridge. 1 – Koibagar I, 71 stone; 2 – Koibagar I, Stone 125; 3 – Koibagar II, 22 stone; 4 – Koibagar III, Stone 295; 5 – Koibagar III, Stone 528; 6 – Gabaevka, plate 62; 7 – Arpauzen III, plate 101; 8 – Arpauzen V, plate 42; 9 – Xan, 10 – Arpauzen VI, plate 51. [Kadyrbaev, Mariashev, 1977].

Fig. 5. Talas ridge, valley of Ters river. Zhaltyraktash. [Sher, Miklashevich, Samashev, Sovetova, 1987, p. 70-78]. The visual reconstruction of the original view (collage).

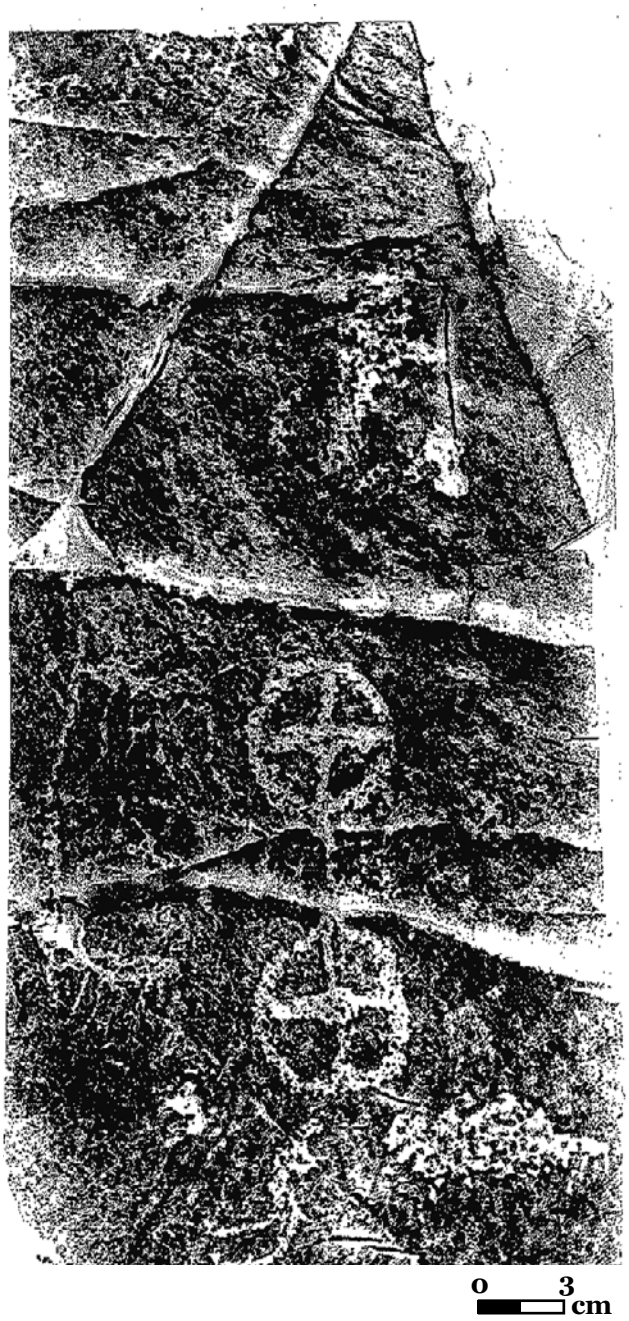


Fig. 6. Talas ridge, valley of Ters river. Chariot. Micalent copy of the image.

Cart imagess were found among petroglyphs in Mongolia [Novgorodova, 1984, 1989], in Tuva [Devlet, 1976, 1980, 1982], in West Kazakhstan [Samashev, 1981, p. 70, 1992, 2006, 2010], Central Kazakhstan [Novozhenov, 1989, 1994, 2002] and Southern Kazakhstan [Kadyrbaev, Mariashev, 1977, Mariashev, Goryachev, 1998, 2002, Mariashev, and Potapov, 2006], in Tien Shan [Sher , 1980], Pamir [Zhukov, Ranov, 1972, p. 540-541], on the Yenisei River in Siberia [Leontiev, 1980, p. 65-84; Leontiev, Kapeliko, 2002], in China [Bao Xingjun, 2006; Yuan Shi, Ti Yu Xing Tai, Yan Hua, 2010; Chen Zhao-fu, 1988; Qi Xiaoshan, Wang Bo, 2008], India [Brooks, Wakankar, 1976] and Pakistan [Dani, 1983; Jettmar, 1975, 1980, 1982] (Fig. 5 -30).

Rock drawings of chariots in Mongolia, the Caucasus and Scandinavia were studied by M.A. Littauer [Littauer, 1977, p. 243-262], who noted their considerable constructive similarity. Theoretical and methodological aspects of the research of such subjects in petroglyphs of Middle and Central Asia were considered J.A.Sher [1980, p. 197-232, 277-285].

Comparing the cart images from the valley Camonica in Italy with the dated Mycene reliefs, and also rock images of weapons with their archaeological findings, E. Anati [Anati, 1960] with help of the «domino» method, managed to reconstruct the most probable chariot diffusion ways in the Bronze Age of Europe, including Scandinavia.

Chariot scenes in the rock art became an object of special study by P.M. Kozhin. Based on analysis of a quite large series of images (150), he distinguishes two traditions in evolving the themes: the Pamirs and in Mongolia. The two traditions are mixed, in his opinion, in the Kazakhstan cart images [Kozhin, 1987, p. 109-126].

Carts and the problem of origin and diffusion of vehicles are considered in interesting studies by V.D. Kubarev, Tsevendorzh, E. Jacobson [2005] and D.V. Cheremisin [2006, p. 90-100].

Of interest are several pictures of carts from Sauskandyk in Karatau [Samashev, 1992, 2006, 2010] with four small wheels

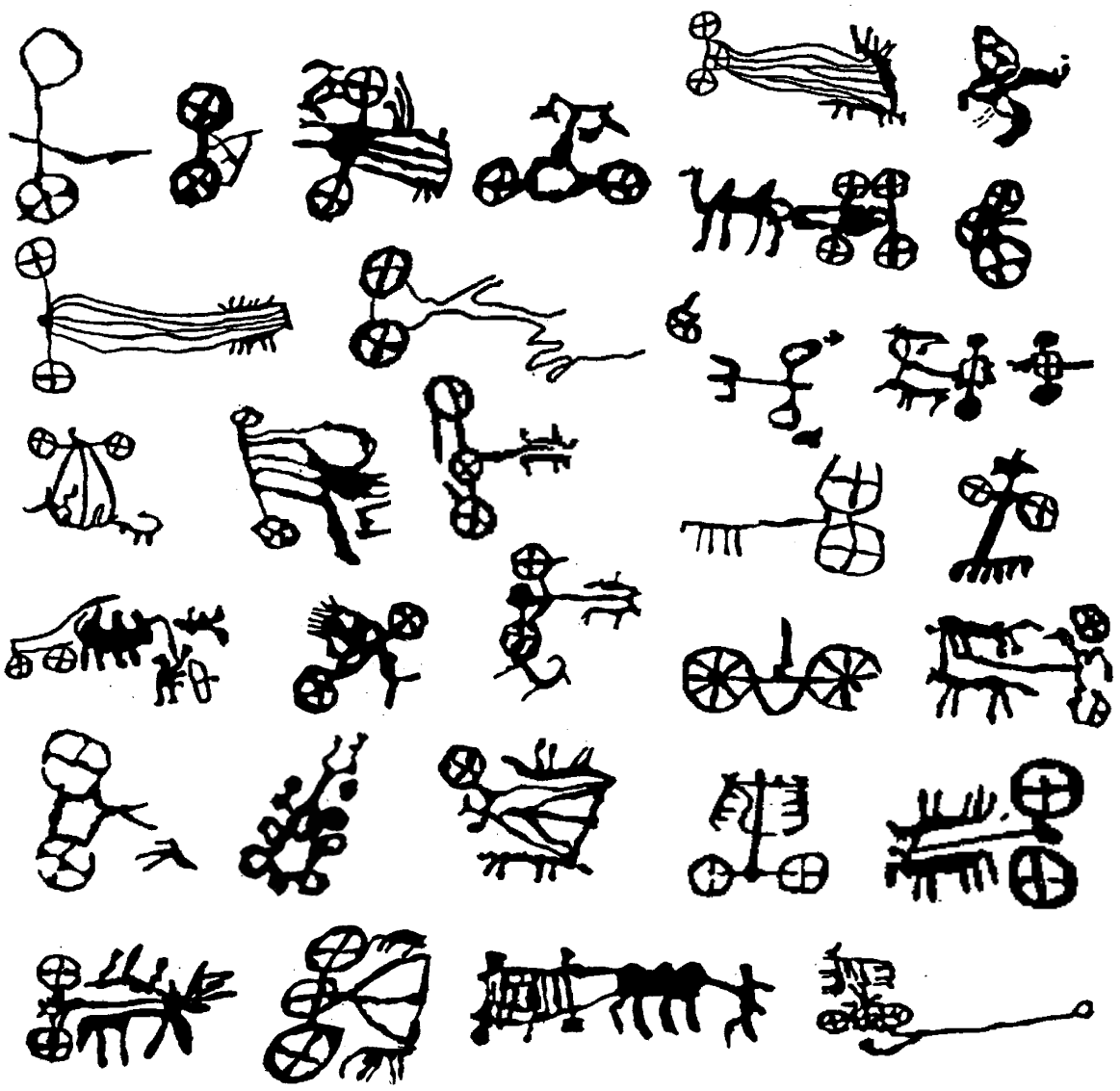


Fig. 8. Karatau ridge. Images of the vehicles. [Kadyrbaev, Mariashev, 1977].

at the corners of a rectangular platform draught by oxen with painted torsos and «A»-shaped draught of the same design as in petroglyphs of Sarmishsai [Rozvadowski, 2004, p. 21] and Kuldzhabasy [Sala, Deom, 2005].

M.B. Slobodzyan identified two trends, based on subjects from the Mountainous Altai, published by Okladnikov and his group members: one proposes gradual evolution of images, the other says of two initial traditions, which mixing up generate a multitude of variants. The review included 82 images of chariots, whose analysis allowed identifying several image features:

• predominant position of draught animals with their backs to the draught-pole;

• pictures of the «profile» are frequent in Kazakhstan and are in majority in the Minusinsk depression;

• uncommon in the Altai are subjects where charioteer are placed behind chariots, except for Kalbaktash-1.

The author upon highlighting subjects with chariots, typical both to Altai and whole Central Asia, concludes that availability of

Fig. 9. Fergana ridge. Saimaly Tash. Images of the vehicles. [Sher, 1980]. The visual reconstruction of the original view (collage).

different types of chariots in images of one location may indicate a difference in chronological or ethnical orders, or it reflects different mythological views [Slobodzyan, 2002, p. 117-119].

H.-P. Frankfort and E. Jacobson questioned the validity of defining chariots as war vehicles due to absence of direct indications or hints to such actions in the petroglyphs, [Frankfort, Jacobson, 2004, p. 72].

D.V. Cheremisin objects the above by noting that monuments of the ancient art realize a conceptual, rather than «photographic», principle of reflection of reality, i.e., to depict a heroic event there is no need to show the whole cycle of actions, but it is enough to use the cart image or its part [Cheremisin, 2005, p. 268-269].

There are also new serious studies on design, harness, cart equipment and fight-

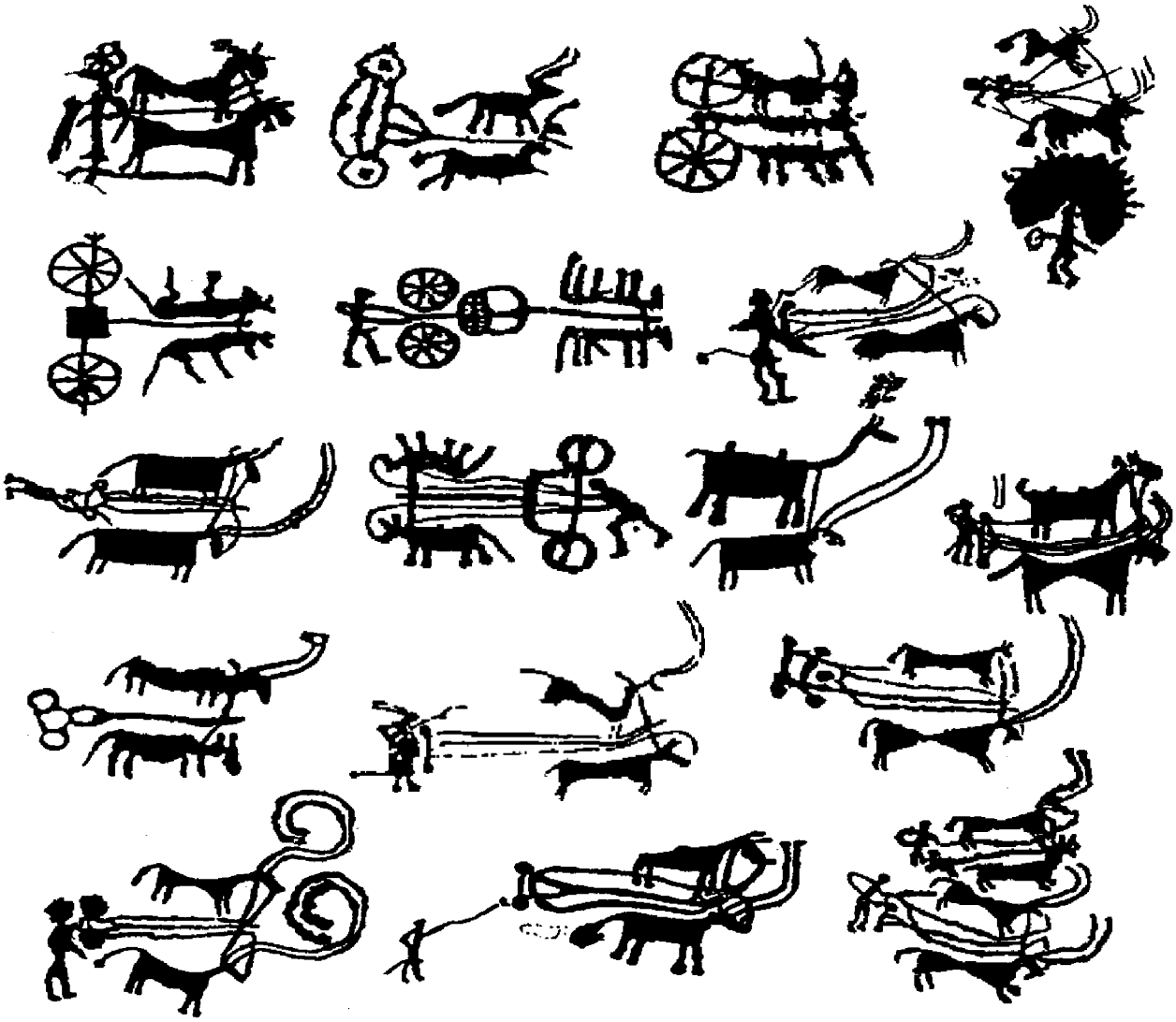


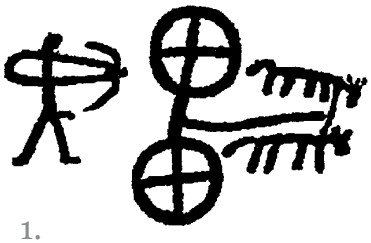
Fig. 10. Fergana ridge. Saimaly Tash. Images of the vehicles. [Sher, 1980].

ing tactics in Ancient Greece [Nefedkin, 2001], on analysis and typology of chariots in ancient China from the Shang Dynasty to the Qin Shihuang [Wu, Hsiao-yun, 2009], new works on Chinese chariots, weaponry and attributes [Varionov, 1995], brilliant works on chariot complexes of the steppe circle monuments Sintashta – Arhaim: A.V. Epimahov and I.V. Chechushkov [2006, p. 168-182, 2008, p. 205-211, 2010, p. 182-229], the works of Russian and European scholars of history of ancient transport, which are of great help in understanding many issues of classification of actual carts [Izbitser, 1993; Gay, 2000; Horses, chariots, ..., 2010].

However, although scope of publications and scientific interest increased in recent years, many issues of studying cart rock images remain unresolved and controversial.

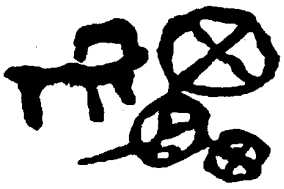
I'd like to highlight main features of cart images on rocks of eastern part of Eurasia:

• wide geographical spread of similar subjects and images, each of them representing a dialectical unity of image and



1.

2.



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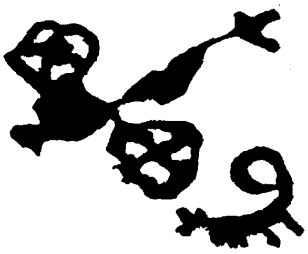


4.

5.

Fig. 11. Images of vehicles. 1 – Indus-River valley, Thor, North Pakistan [Jettmar, 1980, p. 185-221]; 2-3-Chu-Ili mountains, Chumysh; 4-5 – Mountains Anrakhai, Tamgaly [Mariashev, Potapov, 1993, p. 133-142, 2006; Mariashev, Goryachev, 2002].

its mythological content [Steblin-Kamensky, 1971, p. 14-19, 1976, p. 5, Dyakonov, 1977, p. 9-15, 1990; Freidenberg, 1978, p. 15, 28 et seq.].

• sometimes an independent meaning was acquired by the manner of outlining this or other image; iconographic changes in time might be a result of certain transformation of views about image and «miraculous» knowledge about it.

On one hand, there is a striking tendency to portray carts in all the smallest details, including elements of the harness or the chariot gear. This allows us to consider these petroglyphs as a kind of «sketches» of chariots, with purpose to fix on rocks this or that innovation, an achievement in a designer's thinking, once applied in practice. On the other hand, these innovations could be vested only in the «miraculous» form, not obligatory accurate «photographically», but reflecting some important aspects of an ancient worldview.

Geographical spread of these subjects indicates a possible similarity of mythological concepts. Definitely identified are recurring combinations of various personages, united by a common plane, both at the regional level and throughout the whole area. Noted was a stable structural persistence of compositions with carts where they combine with the same images.

It seems permissible to seek a match to such petroglyph subjects, forming a kind of «pictorial series», «a language» or mythological mythologema phrase, in the Indo-European or, more precisely, in the Indo-Iranian and Vedic mythology [Samashev, 1987, p. 16-21, 1992, p.184-211, Sher, 1980, s.270-286, Kuzmina, 1994, 2000, 2008].

However, a documentation degree of published cart images is ambiguous: in addition to monographic, detailed descriptions, there are review articles on cart subjects, where such important data as a scale, a manufacturing technique, position of a given plane in the monument are missing. A significant problem in the descriptions of petroglyphs is the lack of a uniform terminology. Many cart images were published out of context, i.e., of no connection to other petroglyphs on the plane, where they

were found. Arbitrarily copied from rocks to glossy pages of publications, images are artificially deprived of a communication informational system of the monument and of a whole original communication.

This state of affairs is resulting from the lack of modern methods in studying petroglyphs: absence of a reliable dating method based on natural-science laws, failure in «deciphering» and no remarkable progress in the tracing technique. Cart images are often seen locally without consideration of findings from archaeological complexes, with rare exceptions, absent are necessary historical reconstructions. A paradoxical situation: the images «live their own life, isolated from people who created them».

Another problem in historiography rises from the field of communication. There are at least three different channels of communication developed among specialists; let's call them conditionally as Russian, English and Chinese, based on various «signs» of coding/decoding of information. Its consequence is that the «messages», generated by the channels, do not always coincide individually, contradict mutually and cause various debates in specialized editions.

Well, this state of affairs was formed historically, for political reasons; however, this abnormal situation exists in our time, when hundreds of new effective ways of sharing information are working around successfully. A miracle of communication, unfortunately, is still not happening.

It seems that the necessary changes may occur with modernization of scientific methods and their unification, the set-up of international databases of artifacts and dictionaries, as well as of specialized sites on internet, or with currently fashionable «cloud computing» databases, a kind of archaeological virtual «clouds». ■

Fig. 12. India. The paintings in the caves. 1-2 – Chatur-bhu Nash; 3 – Chibbar-Nala, 4 – Dharampuri [Brooks, Wakankar, 1976].

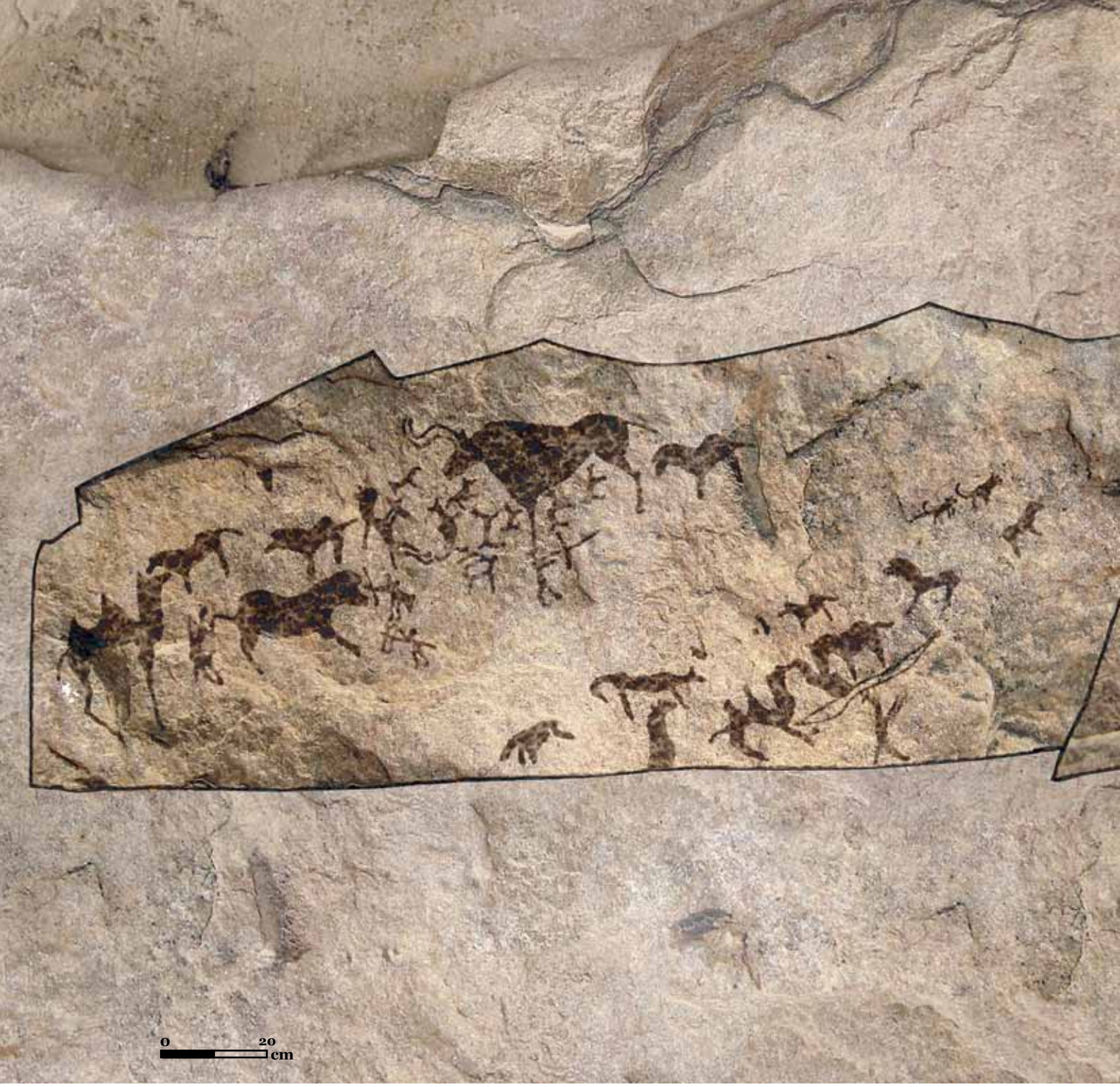


Fig. 13. Kazakh Melkosopochnik. Baikonur III, plate 2. The visual reconstruction of the original view (collage).

Archaeological and pictorial sources

The term «archaeological sources» mean artifacts from documented archaeological complexes with certain traditional and/or natural scientific methods of dating, located predominantly in the steppe zone of Eurasia, and representing:

• grave slabs with painted/pecked images of vehicles (Kivik);

• artifacts with images of vehicles on ceramic vessels, bone articles, clay tablets with pictograms, mosaic panels (The Standard of Ur), bas-reliefs with dating inscriptions (Nineveh), cylinder seals (from Syria and Ugarit);

• models of wheel and carts from the dated cultural layers of settlements;

• «deer» stones with images of vehicles, items of chariot equipment and weaponry;

• a set of charioteer's weapons: spears, chisels, axes, daggers, maces, protective gear from burials;

• graves with wheels, draught animals, the remains of vehicles with a complex of artifacts;

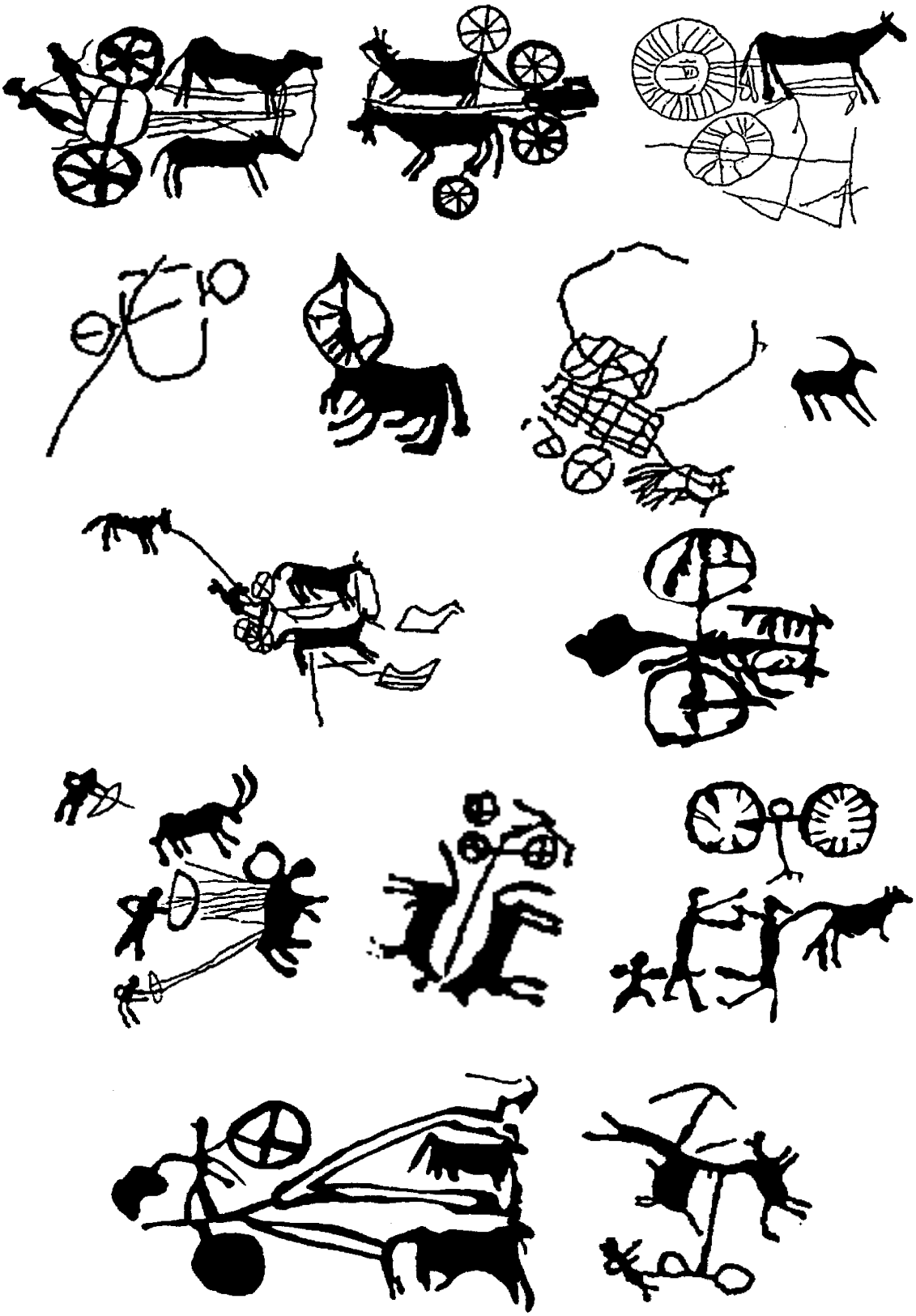


Fig. 15. Koksu river valley. Eshkiolmes. Images of the carts. [Mariashev, Rogozhinskiy, 1991].

Fig. 14. Kazakh Melkosopochnik. Baikonur III, plate 2. The visual reconstruction of the original view (collage).

• a separate issue: study of «a chariot complex», singled out today in archaeological cultures of the steppe and well-dated by the radiocarbon method;

• osteological and paleozoological materials on draught animals (bull, camel, horse, goat);

• artifacts representing a set of chariot equipment: different parts of the horse / bull / camel harness (psaliis, headband plaques, headband belt regulators, bits, «models of the yoke»);

• vehicle design details (tips of draught-poles and axles, pins, couplings, bushings axes, tire fixing nails of bone, rein regulators of draught-poles and goads);

The above sources are clearly characterized as visual: present are images of carts, its fragments, and draught animals.

The concept of «image of a cart» includes: an image of draught animals, with shown, clearly recognizable elements of the harness and other animal control systems; an image of a charioteer(s) with/without weapons or attributes, standing/sitting on a vehicle, walking behind or near the cart; and images of cart itself, with/without elements of design, and conventional images.

Pictorial sources allow us dating cart images and changes in styles of figures within limits of the found archaeological complexes (or before: in cases of secondary use of slabs, containing a cart image).

Conventional images are helpless in defining styles and images, but can significantly refine the dating.

The above sources are organized in a hierarchy by accurate dating: recognized as the most reliable are dug graves with carts and a set of artifacts, dated also by the radiocarbon method. Less documented or occasional findings of isolated or single items should respectively be recognized as less reliable.

Findings of grave slabs with cart images on them can clarify their dating and to set the chronological frames for similar types of vehicles [Sher, 1980; Filippova, 1990, p. 166-168; Chugunov, 2008, p. 53-69]. The body of iconographic sources is expanded by ancient objects: vessels, bone plaques with cart images.

The results of analysis of visual sources are juxtaposed with other archaeological materials: with remnants of actual vehicles that were already found in the steppes of Eurasia, in the Caucasus, in the Ural-Kazakhstan steppes, China and other regions; with clay models of vehicles, as well as with osteological data on draught animals.

There is no unanimity among archaeologists concerning the chronology and periodization of monuments of the paleometal epoch in the steppe zone of Eurasia, which is reflected in my constructions.

Because the archaeological literature on monuments under consideration is very extensive, and the current book is limited in size, a critically minded reader will not find here full descriptions of the study and information on each archaeological site, about origin of each of the quite numerous cultures here, and those valuable opinions and suggestions made «in days of yore». As far as the format of this book permitted, I tried to give more information on objects of the study rather than on views and arguments about them. The vast majority of the latter were already published in detail and listed in the current «Bibliography», and an interested reader in our age of advanced communications will always be able to find any needed information. ■

Written sources

A considerable body of sources is made of a series of ancient Chinese inscriptions on tortoise bones or shells (found more than 150,000 copies) of Xia, Shang-yin and the Western Zhou dynasties.

Important data comes from the «Historical Notes» («Shi-Tzy») by Sima Qian [1972], who described the history of the early Chinese dynasties, along with the history of neighboring peoples of this vast territory.

A separate type of written sources is represented by inscriptions of the Cretan-Mycenaean civilization, so called «the linear script B» [Ventris, Chadvick, 1956, p. 365-366].

The most ancient written texts of Asia, the Avesta and the Rigveda, contain various information on vehicles, and the general Indo-European terms associated with horse and its harness; they were adopted by many ancient languages without significant changes [Gamkrelidze, Ivanov, 1984]. Since all Indo-European languages used the same terms concerning carts, horses, harnesses, common were chariot myths and cosmogony views, so their spatial distribution can indicate directions of ancient migrations and communications.

Here are some quotes about the carts and chariots from the ancient books, based on data collected by E.E .Kuzmina [1994, p. 163-194]:

The Vedic tradition: cargo carts (anas) were of two types: large solid four-wheeled indranasa and two-wheeled aksa with a fixed axis, attached to the car-body with ropes. The wheel consisted of three parts: two segmental parts and a central part with a prominent nave fastened by cross strips [Satapatha Brahmana, 5, 4, 3, 7, 2, 3]. Above

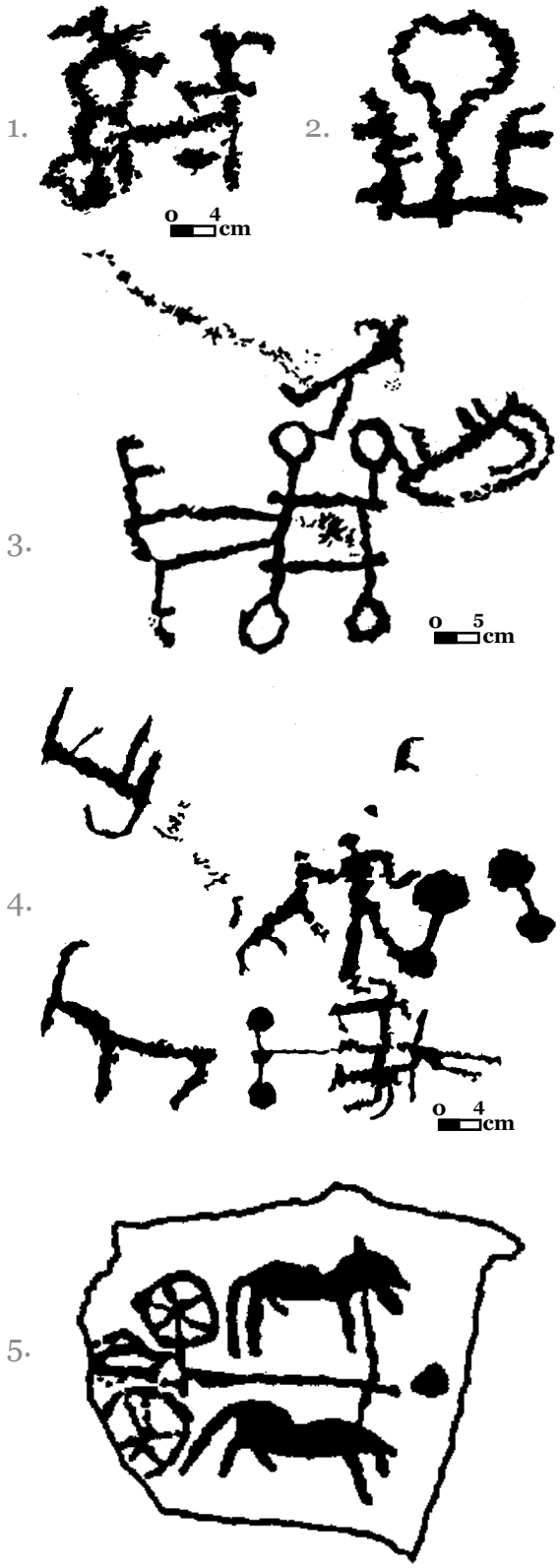


Fig. 17. Tarbagatai. Images of the vehicles. 1, 2 – Tyulkune; 3 – Kurchum; 4 – Moinak; 5 – Saur-Tarbagatai. [Samashev, 1992, fig. 54, 90-93, 100-102, 261].

Fig. 16. Tarbagatai. Grotto Akbaur. Paintings. [Samashev, 1992, p.92, fig.6].
The visual reconstruction of the original view (collage).

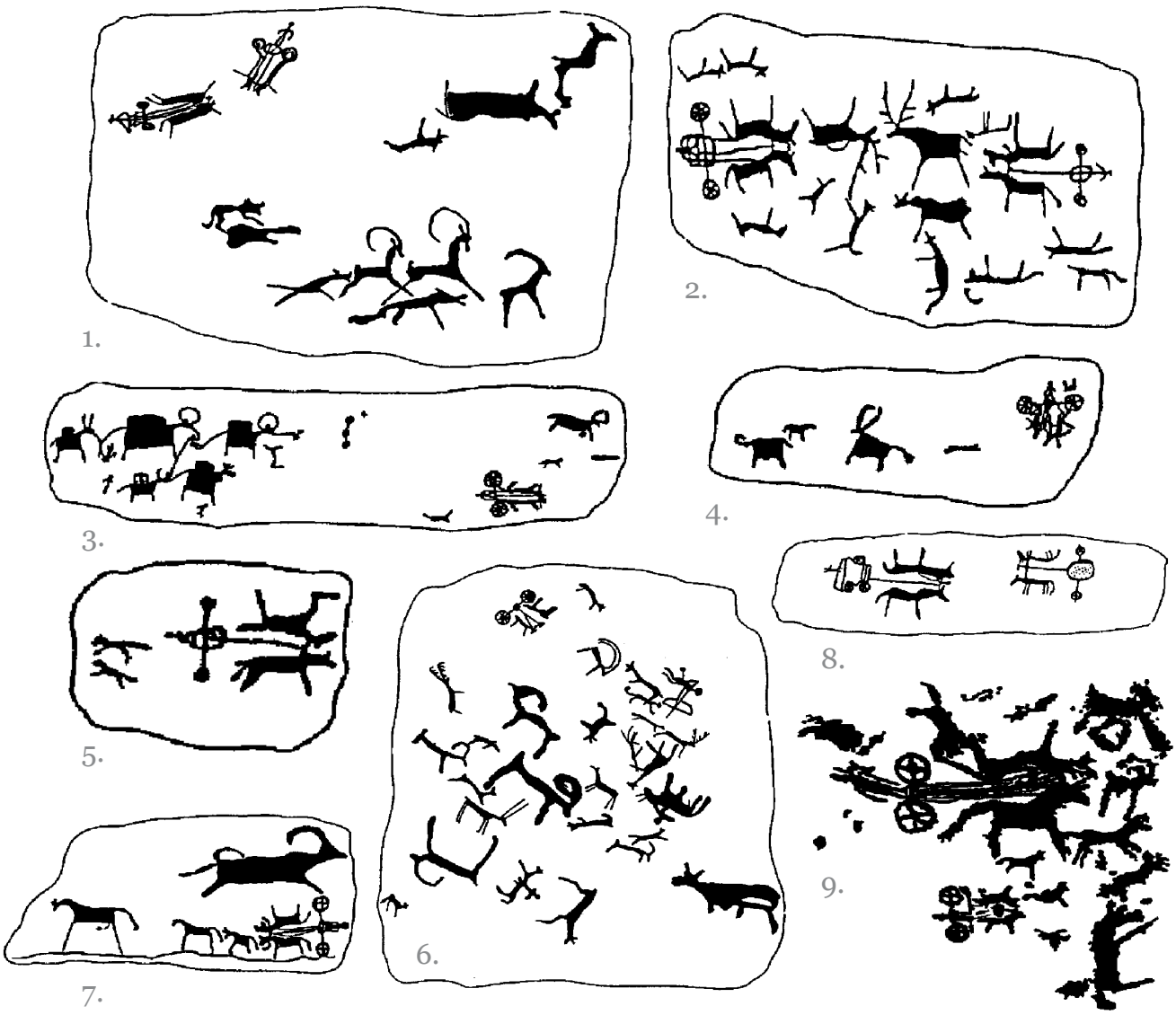


Fig. 18. Gornyi Altai. Elangash river valley. Section 1. Images of the vehicles. [Okladnikov et al, 1979] – (1-8); 9 – Kalbak Tash. [Kubarev, 1990, c. 155-156].

the axis, perpendicular to it was a wooden bar, to which a wooden double pole was anchored with nails. Behind under the body was a loop, probably, serving as a brake.

According to the Shrauta Sutra text of Katian [8, 4, 5], «wheels of both cargo carts are made of three-parts. And they are installed on both sides of the axis ... There are also two draught-poles (i.e., double-pole), which are stretched forward; one bar each in front and in the rear of the axle, they help to pull apart both sides of the pole; ... the yoke is tied up to the bifurcated pole... This way the two carts are constructed». To the front of the pole attached was a yuga – a yoke – with two grooves for head of draught animals. The yoke was tied to the draught-pole with straps; the yoke had four holes for wooden pins to be inserted on both sides of the animal's head. From the yoke, both shoulders of the double pole converged, forming an isosceles triangle.

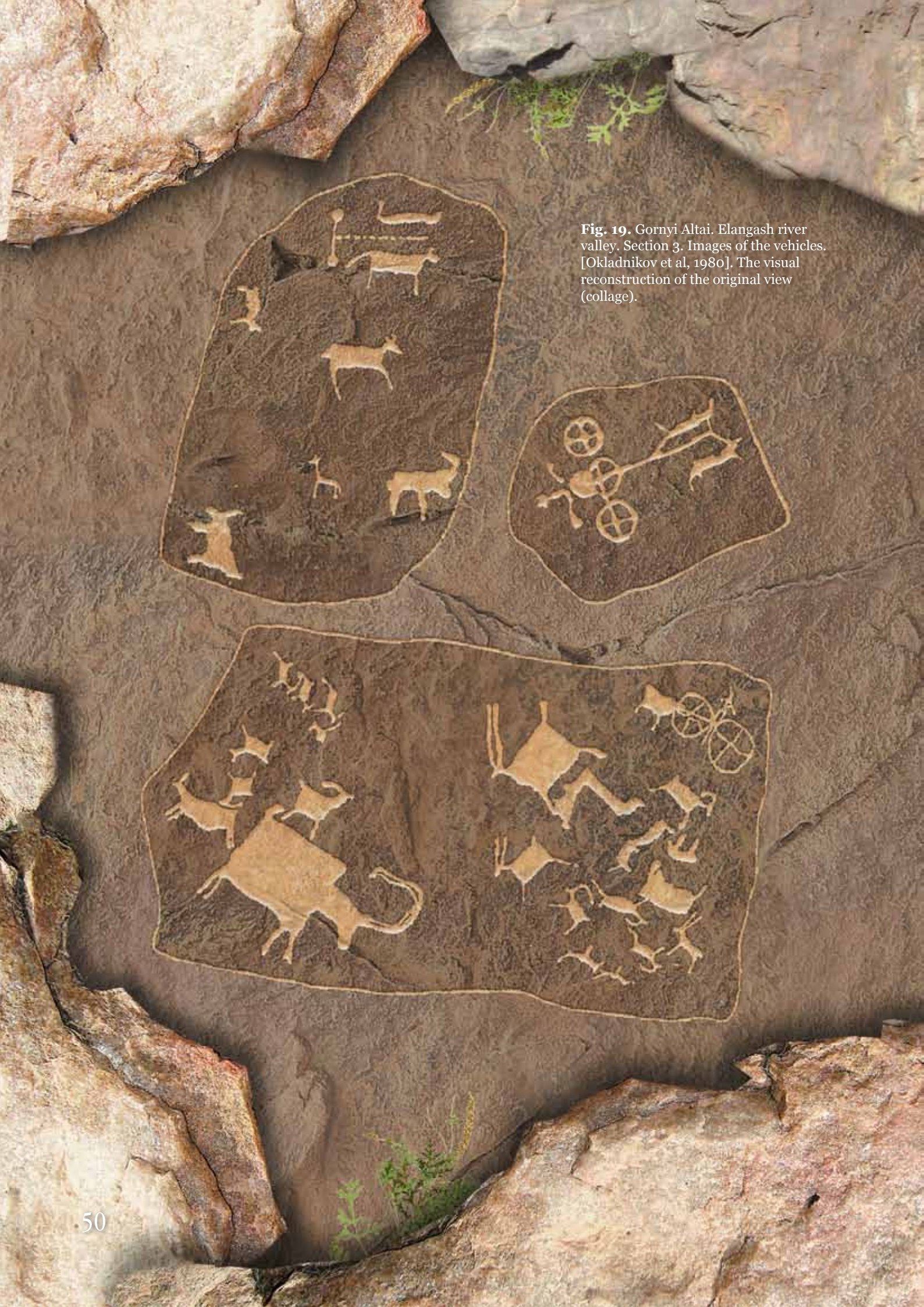


Fig. 19. Gornyi Altai. Elangash river valley. Section 3. Images of the vehicles. [Okladnikov et al, 1980]. The visual reconstruction of the original view (collage).

Fig. 19A. Gornyi Altai. Elangash river valley. Section 3. Images of the vehicles. [Okladnikov et al, 1980]. The visual reconstruction of the original view (collage).

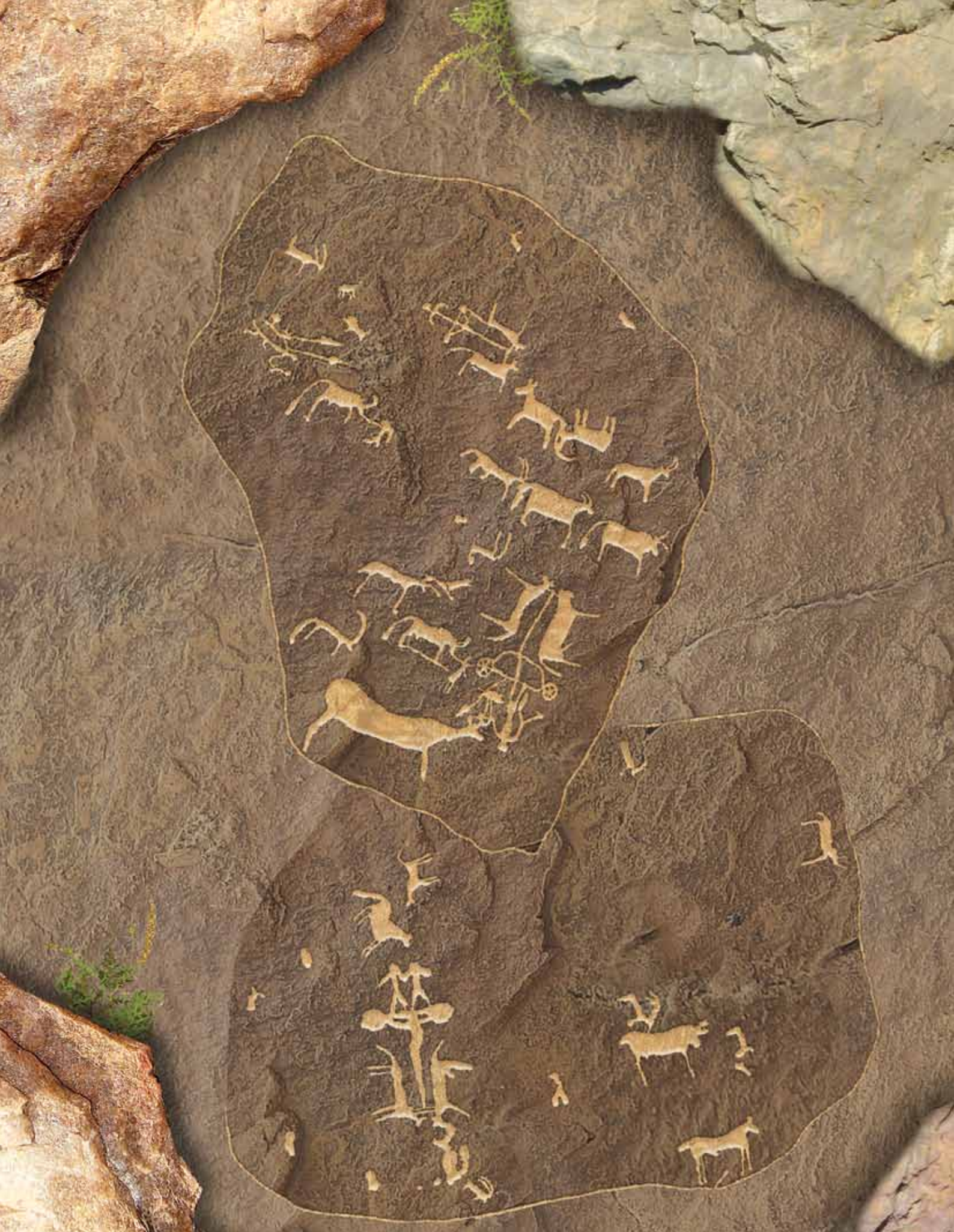


Fig. 19B. Gornyi Altai. Elangash river valley. Section 3. Images of the vehicles. [Okladnikov et al, 1980]. The visual reconstruction of the original view (collage).

Fig. 20. Gornyi Altai. Elangash river valley. Section 3. Images of the vehicles. [Okladnikov et al, 1981]. The visual reconstruction of the original view (collage).

Fig. 20A. Gornyi Altai.Elangash river valley. Section 3. Images of the vehicles. [Okladnikov et al, 1981]. The visual reconstruction of the original view (collage).

Fig. 21. Gornyi Altai. Elangash river valley. Sections 8-9. Images of the vehicles. [Okladnikov et al, 1982]. The visual reconstruction of the original view (collage).

Fig. 21. Gornyi Altai. Elangash river valley. Sections 8-9. Images of the vehicles. [Okladnikov et al, 1982]. The visual reconstruction of the original view (collage).

Fig. 22. Gornyi Altai. Elangash river valley. Sections 9, 12. Images of the vehicles. [Okladnikov, Okladnikova, 1985]. The visual reconstruction of the original view (collage).

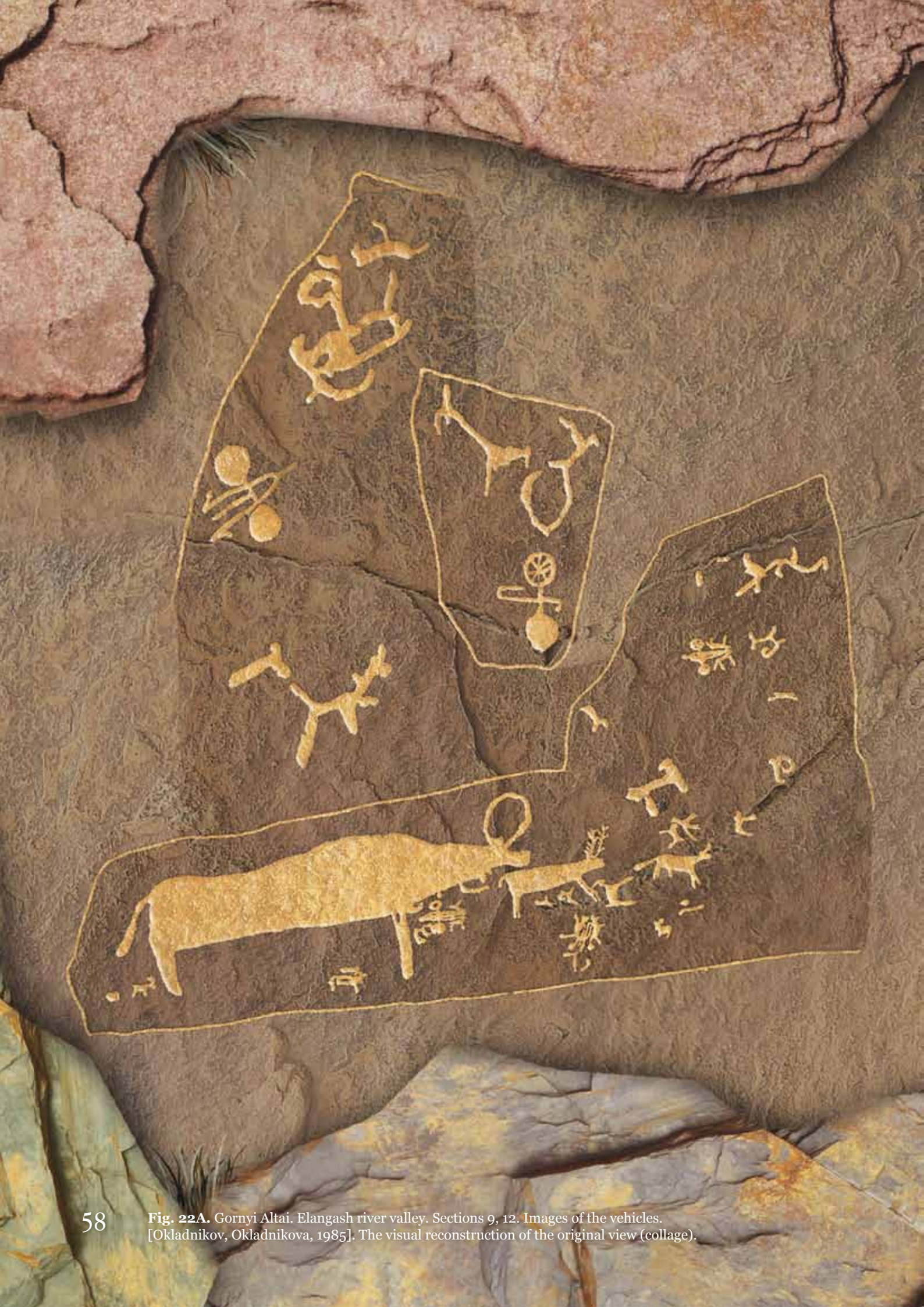


Fig. 22A. Gornyi Altai. Elangash river valley. Sections 9, 12. Images of the vehicles. [Okladnikov, Okladnikova, 1985]. The visual reconstruction of the original view (collage).

Fig. 23. Gornyi Altai. Elangash river valley. Sections 10, 12-15. Images of the vehicles. [Okladnikov, Okladnikova, 1985; Okladnikova, 1990]. The visual reconstruction of the original view (collage).

Fig. 23A. Gornyi Altai. Elangash river valley. Sections 10, 12-15. Images of the carts. [Okladnikov, Okladnikova, 1985; Okladnikova, 1990]. The visual reconstruction of the original view (collage).

In the Rigveda [3, 53, 17], Indra was addressed this way: «You, whose rim is secured against damages, be of help to us! Both oxen shall be hardy, and strong must be the axis. The pole should not come off or the yoke shall not break. Indra has to keep both props (of wheels – V.N.) of carts from breaking». A cart's frame was encased with boards, and over the arch of planks a gadha «hood» of connected mats was lapped. The end wall of the tent had a door. The cart body is a «hut for women», a hearth; gadhapatya is the cart's interior; there is a forked pointed pole, the yokes, a step in the body.

In later texts, six types of carts are mentioned: arohana to carry people, mahanasa to carry the hearth and kitchen utensils, and special types of carts for moving the military equipment and chariots. With help of plain-laid ropes, first harnessed was a left animal, then a right one, halters were put on them with the reins rasmi. At that, a priest would exclaim: «You belong to Varuna! Varuna's rope is put on»[Taittiriya Samhita, 1, 2, 8, 2].

Bulls, oxen, horses, mules and the pair-harnessing of horse and mule were used as draft animals. The Rigveda [8, 6, 48] and later texts mentioned carts harnessed with four camels.

Chariots (ratha). Removable wheels had an indefinite number of spokes, a rim and a nave, sometimes covered with metal. The axis was fixed to the frame by belts, the pole was straight. The Rigveda [4, 40] describes a trotter with a bridle on the head, with the harness on the face, a girth strap behind his neck attached to the harness, and a rope tied around his back. The Satapatha Brahman and other texts mention many times the halter. The Jaimini Brahman [1, 129-130] lists two horses of a divine chariot, poles, ropes, yokes, reins, and both wheels.

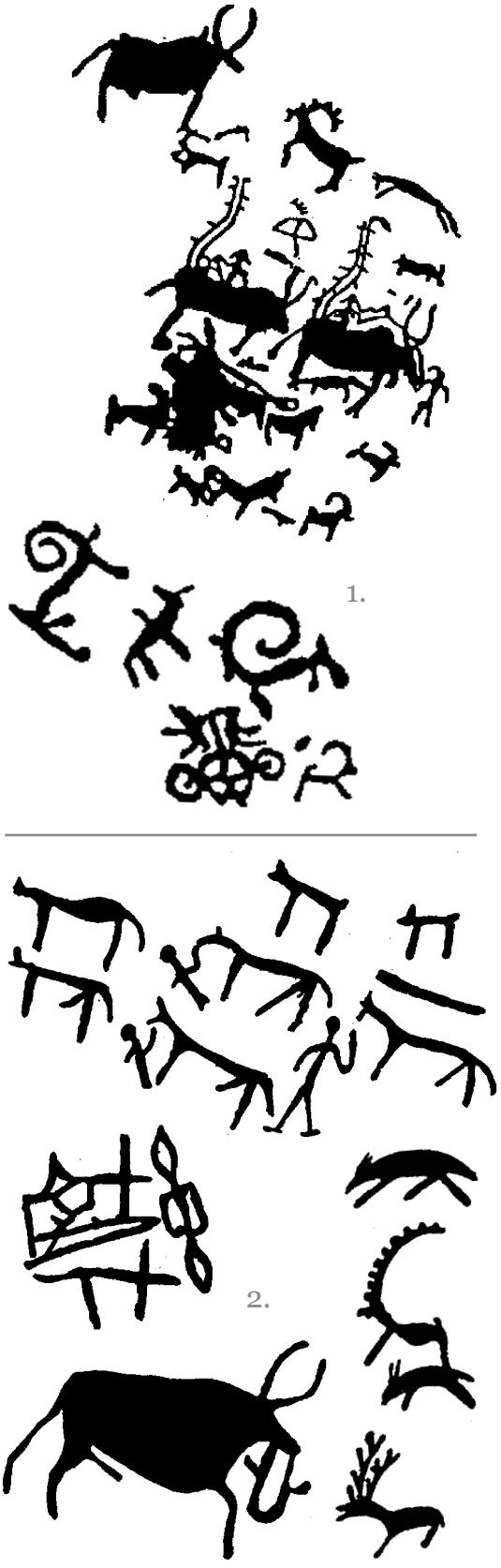


Fig. 24. Mongolian Altai. Images of the carts: 1 – Beger simon; 2 – Manlay Somon. [Novgorodova, 1989, fig. 26].

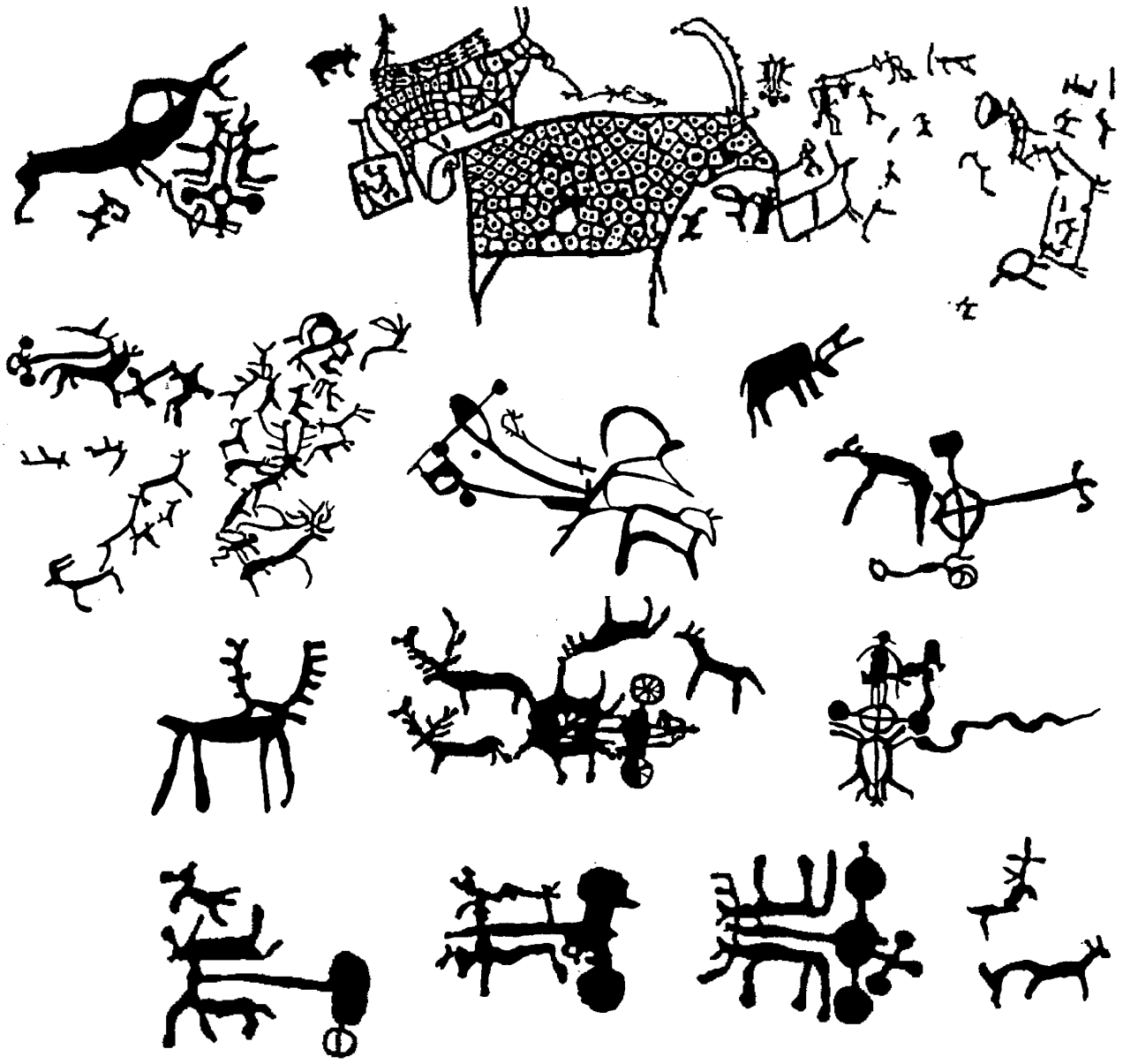


Fig. 25. Mongolian Altai. Chuluut river valley. Images of the vehicles. [Novgorodova, 1984].

The Taittiriya Brahmana [1, 5.12, 5] refers to two leading and two trace changeable horses of the Prajapati chariot, and in the text [2, 103], the chariot «sparkles and is decorated with metal plates and balloons», it is supplied with a pelt cover, sections for gorytus and a quiver. Mounted are a charioteer and a warrior in leather armor. «Indra is a soldier on a chariot, the moon is a charioteer» [Atharvaveda, 8, 8, 22-23]. Descriptions of chariots with a warrior and a charioteer are plenty in the Mahabharatha.

According to V.Rau, the chariot's axis length in the Vedic period was 2m, length of the pole was 3.61m, of the yoke 1.65m [Rau, 1983, tig. 5, p. 18, 24].

In the Vedas, there are 15 synonyms referring to a horse, more than 20 words meaning «the way»/»movement»; a chariot and a wheel make up whole semantic bundles, symbolizing the truth, the law and the cyclic world order.

Fig. 26. Mongolian Altai. Tashgayt. The composition with the chariot. The visual reconstruction of the original view (collage).

Fig. 27. China Images of the carts: 1 – Yangshan, the province of Inner Mongolia, 2 – Lianyungan, Jiangsu Province, 3 – Nanshangen, Grave 102, a bone plate. [Chen Zhao-fu, 1988, Kommissarov, 1980; von Dewall, 1986, p. 168-186].

The Indo-Iranian tradition: in addition to Indo-European «transport» terms, the Indo-Iranian one has fixed a well-developed common horse-breeding lexicon, including, names for colors and different horse ages, of animal body parts, fodder, etc.; general words «chariot», «shaft», «girth», «bridle,» many names for harness parts, and the titles of rituals associated with horse. The term «managing horses» is applied to a higher official, and the term rataistar – «standing on a chariot» – means a representative of the privileged class of warriors, which befit a special insignia: gold, red color and weapons.

The texts from Nuzi (the capital of the country Arapphi) written in Hurrite language preserved the Indo-Iranian names related to transport and horse, and individuated heavy cargo vehicles and light combat and ceremonial horse-drawn chariots. The latter have an axle shaft, a pole, a pair of wheels with 4 or 6 spokes and a nave, some-

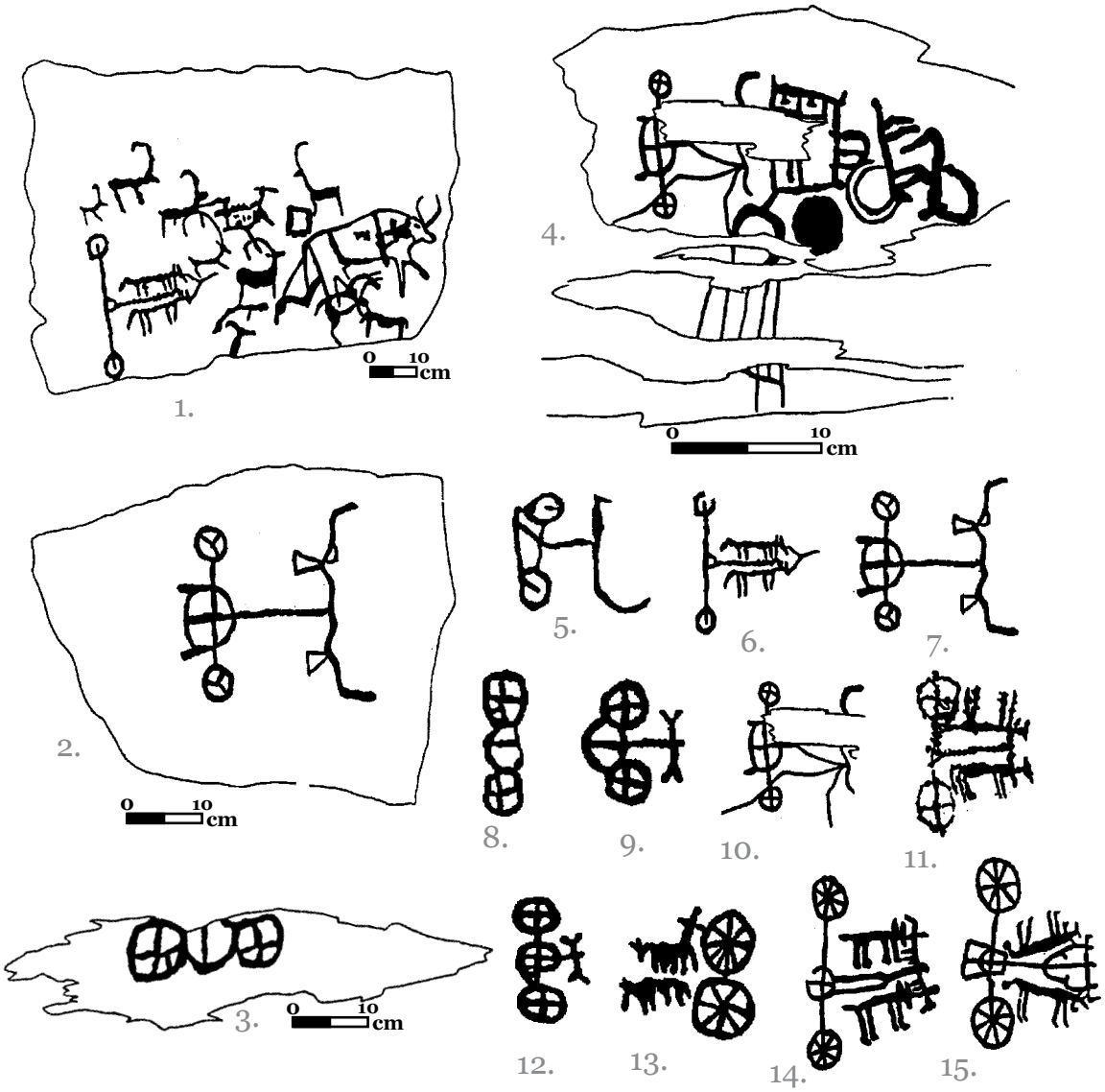


Fig. 29. Western Sayan. Tuva. Images of the vehicles: 1, 6 – «The Way of Chinghis Khan»; 2-5, 7, 8, 10 – Ortaa Sargol; 9, 12 – Mugur-Sargol; 11 – Syyn-Churek; 13-15 – Chinge river. [Devlet, 1976b, 1980, 1982, 2001].

times rimmed with a metal. Mentioned were: collars of wood, leather and wool, reins, a whip with a top made of lapis lazuli.

The oldest treatise on care, reining and training of horses by Kikkuli, the Mitanni charioteer (14th c. BC), written in Hurrite, contains much valuable information: names of horse breeds, on forage and chariot control techniques. All terms in his use are of Indo-Aryan origin, which may witness that all skills of maintenance and control of chariots in the territory of the Near East were brought by Indo-Aryans [Salonen, 1956; Kammenhuber, 1961].

According to the conclusion by V. Nagel [Nagel, 1966, p. 36], in 16th -15th centuries BC a koine is being formed in the military affairs of the Asian Near East: influenced by the Indo-Iranian military aristocracy, chariots and trained horses spread rapidly from Mitanni. Such horses were very expensive: in Nuzi, a horse costed seven times as much

Fig. 28. Chinese Altai. Mountain Mosoto, DC Zheminay. [Bao Xingjun, 2006, p. 125]. The visual reconstruction of the original view (collage).

Fig. 28A. Chinese Altai. Petroglyphes site «Dzungaria», Burdzhin District. [Bao Xingjun, 2006, p. 102]. The visual reconstruction of the original view (collage).

Fig. 28B. Chinese Altai. Mountain Mosoto, DC Zheminay. [Bao Xingjun, 2006, p. 125]. The visual reconstruction of the original form (collage).

Fig. 28C. Chinese Altai. Mountain Peyshen, destinations Dzhunveyshin: 1 – 70x75 cm; 2 – 15x14 cm; 3 – 104x58 cm. [Yuan Shi, Ti Yu Xing Tai, Yan Hua, 2010, p. 32, 95, 105]. The visual reconstruction of the original view (collage).

Fig. 29A. Western Sayan. Tuva. Ust-Mozaga. [Devlet, Devlet, 2004, p 243., Abb. 6]. The visual reconstruction of the original view (collage).

as a bull and 10 times as much as an ass. They were brought from afar, from Mitanni and the northern areas, kept in the royal stables, and sometimes were presented to neighboring lords. The Hittite king Hattusilis III asks the King of Babylon Kadashman-Enlil II: «Send me horses: breeding horses and stallions of high growth.»

The ancient parts of the Avesta use a general Indo-Iranian name of a social group ratayshtar for «charioteers». Only in the Gathas, created by Zarathushtra, the term «chariot» is replaced by the word «rider» – «basar» – with no Indian matches. Since the Gathas were composed by Zarathushtra much later than the oldest parts of the Avesta (supposedly, in the beginning of 1st millennium BC), this proves that originally the Indo-Iranians practiced the chariot battle tactics, and riders appeared only in the end of 2nd millennium BC.

Names of troops are Indo-Iranian terms, one of them goes back to the word «hero», the «winner» and the other to the verb «throw» (arrows, spears) [Kuzmina, 1994, p. 163-194]. Name of throwing weapons is Indo-European, of arrows is Indo-Iranian, going back to the verb «battle»; synonyms for arrows, spears, name of an axe, an adze, a shield, a protective breastplate are also Indo-Iranian.

In the Iranian mythology, one of the seven karshvars (ancestral homes), a Northern homeland, is called Hvanirata (possibly, Gumirayya – V.N.), the country «with elaborately made chariots». In the Avesta, gods Mitra, Sraosha, Anahita (Ardvi Sura), Drvaspa ride chariots [Yasht 5, 10, 30, Yasna, 57, 27].

The warrior fighting gear includes: a sword [Yasht 5, 130, 10, 131, 14, 27], a spear [Yasht 10, 39, 102, 15, 48, 17, 12], a bow and arrows [Yasht 7, 28, 10, 39], and a mace sometimes surmounted by a bull's head, sometimes with a 100 ridges [Yasht 6, 5,

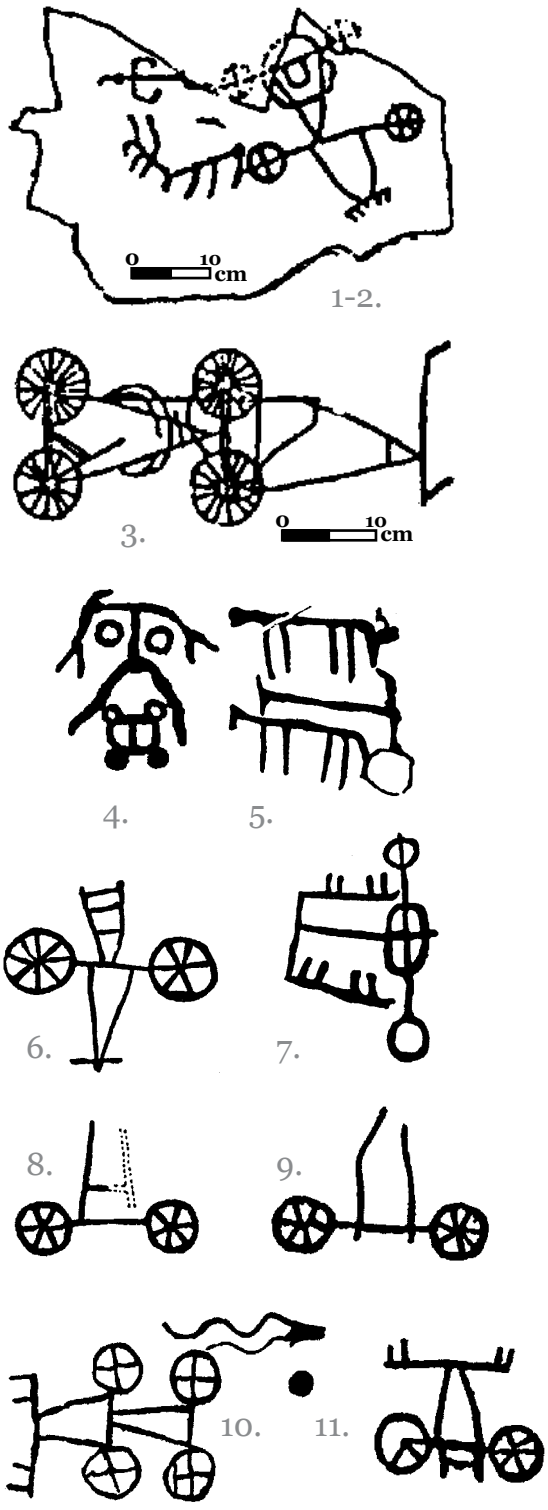


Fig. 30. Southern Siberia. Images of the vehicles: 3 – Oshkolskaya Pisanitsa; 4 – Ust Tuba II; 1 – 2, 7 – 9, 11 – Sedlovina Mountain, 6-7 – Polosataya (Striped) Mountain, 10 – Shishka Mountain. [Leont'ev, 1980, p. 65 – 84; Sevastyanova, 1980, p. 103-107].

10, 96, 101, 132, 11, 10, 11], sometimes made of gold [Yasht 10, 96, 131]. The warrior's body was covered with protective armor, the main part of which was a helmet-cap of cowhide or a metal [Yasht 13, 45, 15, 57] and shield [Kuzmina, 1994, p. 163-194].

The Indo-Iranian and Vedic traditions contain two magnificent specimen of a «miraculous» communicative message, two «messages»: on a Miraculous Chariot and on a Divine Weapon.

The «Miraculous» chariot. Tvashtar the God – the Creator – with own hands created a chariot. The Vedic sources witness the appearance of a group of warriors-charioteers. According to the Aytariya Brahman [VII, 19], the symbols of Kshatriya are «a chariot, an armor, a bow and arrows», according to the Satapatha Brahman [V, III, 5], «a bow is the weapon of a caste of Kshatriyas». Both in the Rigveda and the Avesta, the chariot is an attribute of divinity. Indo-Aryans have a magic chariot Pushpaka, the Nart tales speak of the Barsaga wheel and the self-flying chariot. A special Rigveda hymn [VI, 47, 26 – 28] is devoted to a divine chariot, a special incantation was uttered, when the king stepped into a chariot: «O divine chariot, accept the sacrificial libations!», «Let the standing on you win what should be won!» [Atharvaveda, VI, 125].

The «Miraculous» weapon. In these sources, weapons are a creation and an attribute of gods: Indra has a vajra, a stone ax and a bull-head mace, Yima also has similar mace, while Bhimasena has a stone mace with four ridges. Gods hand over weapons to heroes: Agni gives a bow to Arjuna, Brahma gives an arrow to Rama, and Ahura Mazda – to Yima. It is repeated in the Gathas of the Avesta: «The bow is the power of nobles». The Vedic texts deify bronze knives, awls, stone axes, maces and grindstones. A concept of divine origin of weapons is long stored later with Scythians and Sakas: Quintus Curtius Rufus [History of Alexander, VII, 8, 17-18] tells a legend on heavenly gifts bestowed on Sakas: « A plow and an ox yoke to farmers, a spear and an arrow to soldiers, a cup to priests». Another version of the myth is a story by Herodotus [History, IV, 5-7] on Scythian kings who keep golden gifts fallen from the sky in flames: a plow, a yoke, an axe, and a cup. An echo of these legends is Nartovian tale of golden weapons fallen from the sky [Kuzmina, 1994, p. 163-194].

Actually, this could be an end to this book. Indeed, ancient Indo-Iranians and Indo-Aryans were well familiar with the miracle of communication, the wonderful communication technology of influencing their societies, they were masters of it and applied it in practice, and that was recorded by their written traditions.

However, we did not get clear answers to the questions: who are these ancient Indo-Iranians and Indo-Aryans? How archaeological and pictorial sources correlate with them? How did these almost forgotten people move across space and time? A search for the answers determines the range of objectives of the present study. ■

Territory

In the Soviet archaeological literature, the concept of «Central Asia» includes the territory of Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan and southern Kazakhstan. After the collapse of the Soviet Union, the term become irrelevant and is rarely in use now. More common are self-naming of the new states and the geographical concept of «Central Asia». This understanding (including Kazakhstan) complies with an English term of Central Asia. The Russian concept of «Central Asia» covers the territories of East Kazakhstan, Altai, Trans-Baikalia, Inner and Outer Mongolia, and corresponds to the term of Innermost Asia.

Along with the geographic concepts of territory: the Mediterranean, Trans-Caucasia, Scandinavia, in use today are: an adopted administrative division of the former USSR along the state borders of 1991, the existing frontiers, and names of the states newly emerged in the area.

Geographical concepts do not always coincide with their historical and cultural equivalents. Territorial division of the historical and cultural regions is conditional; therefore the current paper adopts the physical-and-geographical understanding of the area. «The steppe Eurasia», «A great steppe belt of Eurasia» – these are the terms that define a territory of similar landscape, natural and environmental conditions and located along meridian stretch over a large part of the continent. This term includes the well-established concepts, included in the professional literature: «the Black Sea» steppe, «the South-Russian» steppe, «the Ural-Kazakhstan» steppe, the Kazakh low hills (Sary-Arka, Bet-Pak-Dala), the Near Aral Sea, the Caspian depression, the Barabinsk steppe, the Minusinsk depression, the steppe and semi-desert area of Inner Mongolia and Xingjian, China's central plains, the steppe area of Mongolia, as well as other common geographic concepts. However, the book widely uses historically established names of regions: Turan, Maghrib, Margush, Margiana, Ordos, Turkestan, East Turkestan and other, historical and geographical understanding of which is also available in the literature.

Since a key role in communication processes in these regions belongs to the innovations in breeding of domestic animals, and in particular, in domestication of horses, and an extensive use of them was only possible on grassy surfaces, where yet unprotected hooves would get erased slower, therefore we will consider here also the vast plains of the northern part of Sahara, the Middle and the Near East, which in the paleometal era were much more moistened and grassy, in comparison to their current state. ■

Tools and methods

The approach to the analysis of the attracted sources is dictated by the mobile nature of pastoralists' societies under study. A typological and technological method based on a technique features for manufacturing the individual structural elements of a cart, was used in the classifications.

Reconstruction of historical processes was undertaken by the methods by the French historical school [Garden, 1983, see: Stoianovich, 1976, Lamberg-Karlovsky, 1990, p. 3-21], which assume identification of laws, cyclically recurring each time at a new qualitative level. Analysis of pictorial monuments and of data of mythology, folklore and archeology is based on the comparative-historical method and on the principles of historicism.

A significant influence on my views on the historical processes in the Eurasian steppes was rendered by the works of L.N. Gumilev, dedicated to the problems of ethnogenesis of peoples inhabiting it; and, above all, by the part on «passionarity» of processes of initial development of an ethnic group. Mapping of the monuments, widely used here, clearly shows their location in space and routes of communication.

Computerization of some research stages allowed using software packages for image processing, their visual comparison and the three-dimensional modeling.

Methodological bases to study process computerization in case of petroglyphs do not differ from those used for describing and analysing any other archaeological materials. They were first formulated in the 1950s-1960s [Gardin, 1958, 1960, 1963, 1965, 1967, 1968, 1974, Sher, 1977], followed by much deeper methodological studies [Gardin, 1971, 1974, Sher, 1970, 1977, Kamenetsky et al, 1975].

In due time, a whole range of studies was implemented, which facilitated narrower computer «specialization» for work on petroglyph images [Anati, 1968, p.133-155, 1969, p. 63-71, 1970, p. 255-261,1977; Sher, 1977], investigated were: information recording, methods of image classification and interpretation, and a methodological framework for documenting and describing the petroglyphs [Anati, 1977, p. 35-61; Sher, 1980], computer-based methods have been successfully used in a number of works by western scholars dedicated to study of petroglyphs of Sahara [Striedter, 1983, 2004] and Northern Europe [Burenhult, 1973; Bertilsson, 1989].

Gradually new areas of application of computers opened up in the study of petroglyphs: electronic mapping system was developed for a group of monuments in the northern Swedish province Boguslen [Bertilsson, 1989, p. 287-321].

Emergence of new generations of computers capable of processing graphic information, has led to a new application level; possibilities of using such systems for documenting archaeological investigations, reconstructions, simulations have already been considered by some authors [Reilly, 1988; Poykalaynen, Talpsepp, 1990, p. 30-33; Rogozhinskiy, Khorosh, Charlina, 2004, p. 156-161; Shvets, 2005, p. 275-276; Epimakhov, Chechushkov, 2008, 2010 and others].

Database (DB) and the procedure

Two levels in practical use of computer systems should be distinguished: (1) design of the structure and principles of describing a

database with simple subsystems; (2) system capacity expansion by using elements of artificial intelligence – the expert systems.

The following are some observations resulting from development and use of computer system of the first level, omitting unnecessary technical details [Novozhenov, Smirnov, Sher, 1993]. A principal diagram of a database (DB) is:

• Image uploading to a computer from photo/video cameras or «image digitizing» allowing a quick and accurate copying of thousands of rock images.

• A description in English, French or Russian, so that description, created in one language, is automatically generated in other two. Languages should to be chosen at the start of a session. (See Appendix 1).

• Analysis. A database is supplied with a system of operative search of needed information as per the given description attributes. The researcher can, using any combinations of signs, to get interesting information in the forms of both verbal descriptions and of graphic image representation. All information can be sent to print or to the Net.

Description and terms

Describing any archaeological site requires from a researcher to use or create a description language, a meta-language [Sher, 1980, p.43-60], which always contains two contradictory requirements: it should be fairly standard, and, at the same time, universal to describe as much as possible all accessible information. Any standard, as well as universality, cannot take into account and predict new features of an object, including rock images of carts. Consequently, a description system and the meta-language itself must be initially flexible and open for input of new features. This entails a requirement: a description system has to operate a significant number of such characteristics (description fields).

Any verbal description of a petroglyph will never be able to reflect fully the image, because of our incomplete knowledge about an object, and because of the mismatch between the two sign systems. Each rock image can be viewed as a kind of «thing in itself «, full information on which will never be obtained. Nevertheless, unclaimed information is stored within the «thing» in proportion to increase in our knowledge about it.

It is necessary to develop a verification system for any historical conclusion, based on archaeological materials. However, guided by common sense and an inevitable sequence of separate stages of the cognition process, it is possible to organize our knowledge (the information) as an aggregate of data – the bigger possible the better – which can be obtained from an archaeological object, according to the main stages of scientific research.

Initially all information is of two types: documenting and informative, consisting of the basic descriptors, whose values are specified in due manner by dictionaries:

• geographic location of a monument;
• title of a monument;
• macro-topography;
• micro-topography;
• image preservation state;
• image performance technique;
• scale of a copy;
• source of information.

These description units are grouped in two classes: hard vocabularies and a free text (comments). Descriptors of the first type can be found automatically, as opposed to a free text, automatic search on which requires some extra effort and is not always necessary.

Documenting information, as a rule, is always concrete. Therefore, description fields use only one value.

Informative information is derived from the following descriptors of the constituent elements of a cart image:

• description of a cart design;
• description of a charioteer(s);
• description of draft animals;
• features of a design image;
• features of a charioteer and draft animals;
• mutual positions of the elements.

In case of informative description, one and the same characteristics can be expressed by several terms. For example, charioteer's hands at the same time could be raised up (right hand), lowered (left hand), or bent at elbows. Therefore, informative description fields may have more than one value at a time for describing an attribute.

The most difficult section on a database structure is defining the description fields and the choice of terms (a hierarchy construction). The procedure for this choice is subjective and depends largely on researcher's qualifications and intuition, as any description of archaeological objects using information technology or without it.

The literature about petroglyphs already contains identified methodological principles for selecting the attributes to describe images of animals [Sher, 1980] and images of man [Pyatkin, Martynov, 1985; Rogozhinskiy, et al, 2004], which are tested in large series and could be used.

Quantitative indicators, as well as obvious characteristics of an object both in documenting and in informative parts, are quite reliable. If we proceed from a principle of evidence, an investigator should describe the explicit features of an image, according to the internal structure of the object. A cart image is a set of data on cart design, a charioteer and draft animals. These attributes, in turn, consist of a set of specific elements. Description of the design is impossible without information about wheels, a platform, its position, axis, a pole and details of the harnessing. Details of the charioteer is made up of descriptions of his head, arms, legs, torso; images of draft animals can described their species, number and position of feet and such elements such as head, body, tail.

Along with these obvious elements of each image, there are, as a rule, features in their interpretation, as in comparison with a real prototype, and so in the ratio of all elements of a carts in a particular image. Therefore, introduced were description fields fixing design features, position of a charioteer and his attributes position of draft animals and their details. In total, 65 description fields are in use.

If necessary, new description fields and new reply variants unlimited in number could be introduced. As practice on use of the complex shows, in the process of describing a large number of images, «a natural selection» of working/failing attributes occurs, same as with reply variants. The final assessment of necessity in changing the given descriptions is conducted by a qualified expert or a group of them.

The description terms (see the Glossary) are charged with a primary meaning, and their choice and interpretation is an important task of any description. The database utilizes terms already included in the literature on carts [Littauer, Crouwel, 1979, p.3-7; Piggott, 1983, p. 2, with results of discussion about the terms in the «Antiquity» journal, vol. LVIII, 222, 1984, p. 71-72; Epimakhov, Chechushkov, 2008, 2010]. The list was extended by special terms, characterizing the features of rock cart images (e.g., «circuit», «silhouette», etc.) and is supplied with both English and French equivalents.

Conformable to the database structure and according to the selected descriptions fields, terms are divided into documenting and informative.

Documenting terms may include both general and specific information. For example, the term «cart» is a general description

for all types of wheeled vehicles: chariots, gigs, wagons, the term «Altai» represents a specific geographical region.

Informative terms fix a particular variant in imaging of a particular element. The number of the variants is limited, so each of them is assigned a verbal equivalent. For example, the term «wheel» includes the meaning of terms denoting options for its imaging on rocks: a wheel with spokes shown, the disk wheel, shown by solid pecking, «cross bars» shown with overlapping boards or a grooved wheel.

Along with special terms, the informative descriptions widely use terms taken from geometry, which by themselves do not require any special explanation: «direct», «curved», «triangular», «round», «rectangular,» «plan,» « profile «, etc., although their use in the system is always conditional.

It is hard to expect from an ancient artist to outline geometric figures on a rock accurately because of manufacturing techniques and the overall concept of an image. Therefore, geometric terms here imply only maximal match of an image element to a certain geometric figure.

Terms «contour» and «silhouette» reflect predominantly a technique and a style of making figures: contour (or line) pecking or solid pecking (or filling in with a paint) of the entire surface.

Analysis and comparison

Classification of rock images has a dual nature. On one hand, it treats what was shown (a content plan), and, on the other, how it was shown (an expression plane). The same image can be realized on rocks in different manners. A visual comparison of images is sufficient for determining a typology; bur a more sophisticated analysis will be required for selection of styles. A style is made of revealed and persistently recurring iconographic features.

Although selection of a fragmentary structure of types and subtypes does not prevent from many other additional studies, they also tend to rely on visual judgments. It is obvious that cart images should be compared to ancient types of actually existed carriages known in the history. This is not always feasible due to absence of clear design features in cart images. But their iconographic features are easily recognizable; they have both a global character and local variations.

Initially, all cart images are considered as of 2 types: biaxial wagons (4W) and single-axis gigs (2W). The latter also includes images of chariots, which were grouped here as a separate type.

To carry out comparisons, researchers operate with an image proportions [Lumley, 1968; Sher, 1980, p. 50-52]. A distance ratio between pairs of fixed points of an image can be represented as proportionality coefficients, convenient for mathematical analysis. Reference points in each image are defined semi-automatically or automatically. Such points of cart images fix length of pole and the wheelbase dimensions, length of the platform and a maximal wheel size. Proportionality coefficients for distances between points are the basis for comparison. Visualization of all indicators used in the database is given in Appendix 1.

Visual methods were utilized in classification of rock cart images. Comparison was carried out within the entire array of rock images, by geographical regions and types of carriages.

Selection of each type and subtype in the suggested classification was verified by comparison to actual types of carts, well-known in ancient times, taken from graves, and with classifications of other authors. ■

Chapter 1

Spread of a cart image among petroglyphs of Eurasia and classification of cart images

Rock images of vehicles are quite widespread in petroglyphs of the West part of the Eurasian continent: in Scandinavia, the Mediterranean and the Caucasus. In these areas, the images have been better studied because of their combination with well dated artifacts: axes, daggers and other, helped by long-term systematic archaeological research on the territories. The dating was refined by numerous findings of models of vehicles, elements of the chariot harness and the remains of vehicles themselves. Classifications of the rock art images are well developed, which permits us focusing their «styles» and typology.

Scandinavia (10, Fig. 31-34)

The body of petroglyphs in this area is very diverse in subject and was published in numerous editions, a mere enumeration of which would occupy several pages. Some ideas about them are conveyed by the review studies [Glob, 1969; Malmer, 1981; et al.]

Many of one-type rock drawings have been found in Sweden, Norway and Denmark. In total, there are more than 60 known images of vehicles. They are concentrated mainly in Sweden: 28 in the Bohuslen province, 16 in the Skane province, 16 in Ostfolde (Norway). In the south-eastern and West parts of Sweden and the Esteryetland province one-two images in each place [Malmer, 1981, p. 43].

Gryt, the Skane province. Five images of chariots, solar signs and cups (round cavities) were engraved on a massive horizontal surface. Draught horses are shown schematically. [Historiska nyheter, 1976, p. 18].

Frennarp, the Skane province. A horizontal surface contains 12 pecked images of unharnessed chariots turned with their draught-poles sideways. Another surface has four pecked gigs, three of which are harnessed with horses; the animals shown schematically [Anati, 1960, p. 59, fig. 12; Hayen, 1986, s. 109-138; Piggott, 1983, p. 117, fig. 70-A].

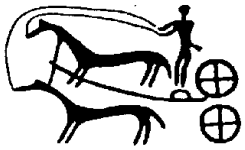
Bottna, the Bohuslan province. A surface 364 contains an image of a biaxial vehicle on spoked wheels, drawn by two horses, with a boat overlapping the image. The vehicle is a combination of two chariots (10.B05).

A surface 384 has an image of four-wheeled vehicles with a rectangular body and disc wheels (10. B04), surrounded by a man figure, cups and non-identified images [Fredsjo, 1975, p. 118-120].

Svennebi, the Bohuslan province. A surface 232 has a single vehicle image on four spoked wheels, made of two joined chariots, the second has an A-frame draught-pole (10. Kv2) [Fredsjo, 1971, p.18, 47].

Region	A1a	A3c	B1a	B1b	B1c	B1d	B2a	B2c	B3a
Skone	2	–	7	–	–	–	–	–	–
SW Sweden	–	–	1	–	–	–	–	–	–
Ostergotland	2	–	–	–	–	–	–	–	–
Bohuslan	–	1	4	2	7	1	3	–	1
Ostfold	–	–	1	–	2	1	–	1	–
W Sweden	–	–	–	–	–	–	–	–	–
Total	4	1	13	2	9	2	3	1	1

Region	C1f	C1b	C1c	C2a	C2b	C2c	C2d	Total	%
Skone	7	–	–	–	–	–	–	16	14,5
SW Sweden	–	–	–	–	–	–	–	1	1,5
Ostergotland	–	–	–	–	–	–	–	2	0,5
Bohuslan	–	1	4	1	1	2	–	28	2,5
Ostfold	–	–	3	–	1	–	4	13	4
W Sweden	1	–	–	–	–	–	–	1	2
Total	8	1	7	1	2	2	3	60	1,5

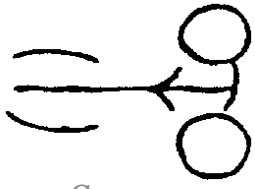


A1a.

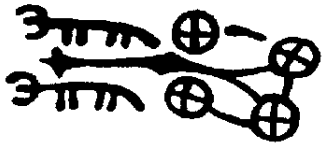
A3c.

B1a

B1b



C1c



B2a

C2d

Fig. 31. Scandinavia. The main types of rock art vehicles. [Malmer, 1981].

A surface 245 has an image of a gig (10. Kv3), drawn by a pair of animals, shown schematically [Fredsjo, 1971, p.18, 47].

Quillen, the Bohuslan Province. A surface 308 has images of two gigs pulled by horses. Behind the second gig, is a standing figure of a man with raised hands and fingers spread wide apart (10. Bo1-2).

A surface 334 contains an image of a two-horse chariots and a charioteer (10. Bo6), similar to a pecked image on the slabs in Kivik. A separate surface contains pecked images of two chariots, one shown without a draught-pole [Fredsjo, 1975, p. 33-34].

From the above not very complete review, we may deduct features of the Scandinavian pictures: chariots have neither charioteers, nor draught animals; the latter are shown schematically; there is one cart type made of two joined chariots, one of them has, as a rule, an «A»-shaped draught-pole, for example, images from Rishd (Bohuslan), Langone (Norway) and other monuments (10. Of1; 10.Of3 10. Of10, 10. Kv2; 10. Bh1), [Hayen, 1986, s.117]. This cart type occurs in the Minusinsk Basin and Mongolia (the Gobian quadriga).

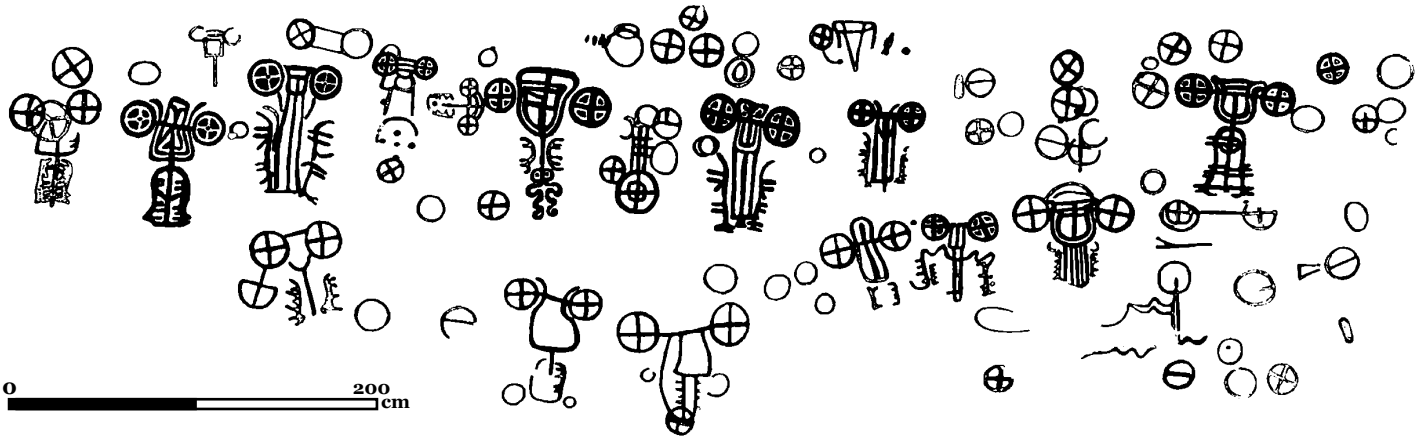


Fig. 32. Scandinavia. Frennarp. [Larsson, 2004, s. 387, abb.6].

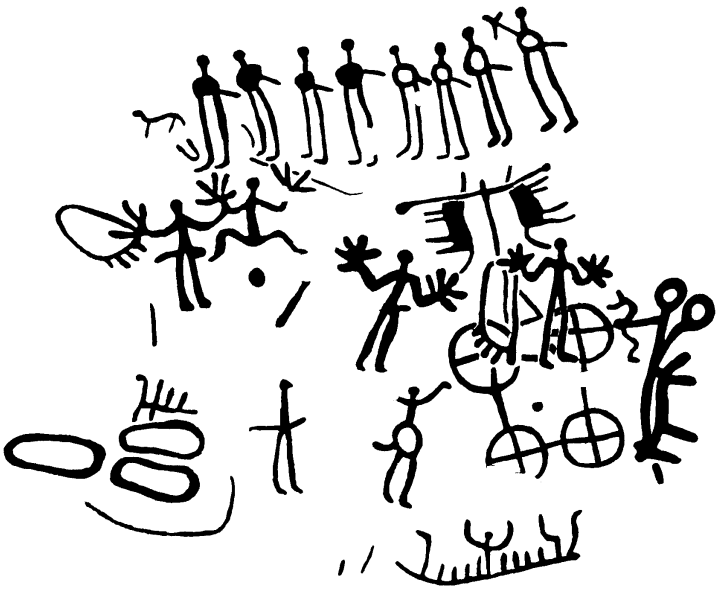


Fig. 33. Scandinavia. Bohuslan Province. Askum. [Larsson, 2004, s. 396-397, abb. 21-22].

M. Malmer identified several indicators in vehicle images in Northern Europe. The images were divided initially into three groups depending on presence or absence of draught animals and a charioteer: A – vehicles with both draught animals and a charioteer; B – vehicles with draught animals and with no charioteers; C – unharnessed vehicles and no charioteers. Then the images are divided by the number of wheels: 1 – two-wheeled, 2 – four-wheeled, 3 – one wheel is shown. Further, the images are classified according to a wheel type: a – four spokes; b – no spokes, with a dot in the center (or shown as two concentric circles); c – a wheel is shown as a circle; d – a wheels of solid pecking. Combination of these elements allows us describing certain types of vehicles. Seven basic types were identified (Fig. 31), [Malmer, 1981, p. 43-46, fig. 16, tab. 7].

The Mediterranean (9, Fig. 3539)

Rock drawings of vehicles found in three main areas:

9.1. Greece. Different time engravings of dogs, deers, archers, riders were found in the Kavala place and on the slopes of the Mount Pagayon. There are many images of intertwined lines in combination with various signs, including solar ones. In one case, an engraving of a boat with a mast (?) and images of vehicles were copied. Apparently, these are three A-shaped chariots connected in a row (9.1.KL1). Below are four feet imprints. [Ataktidis, 1988, p. 16-24].

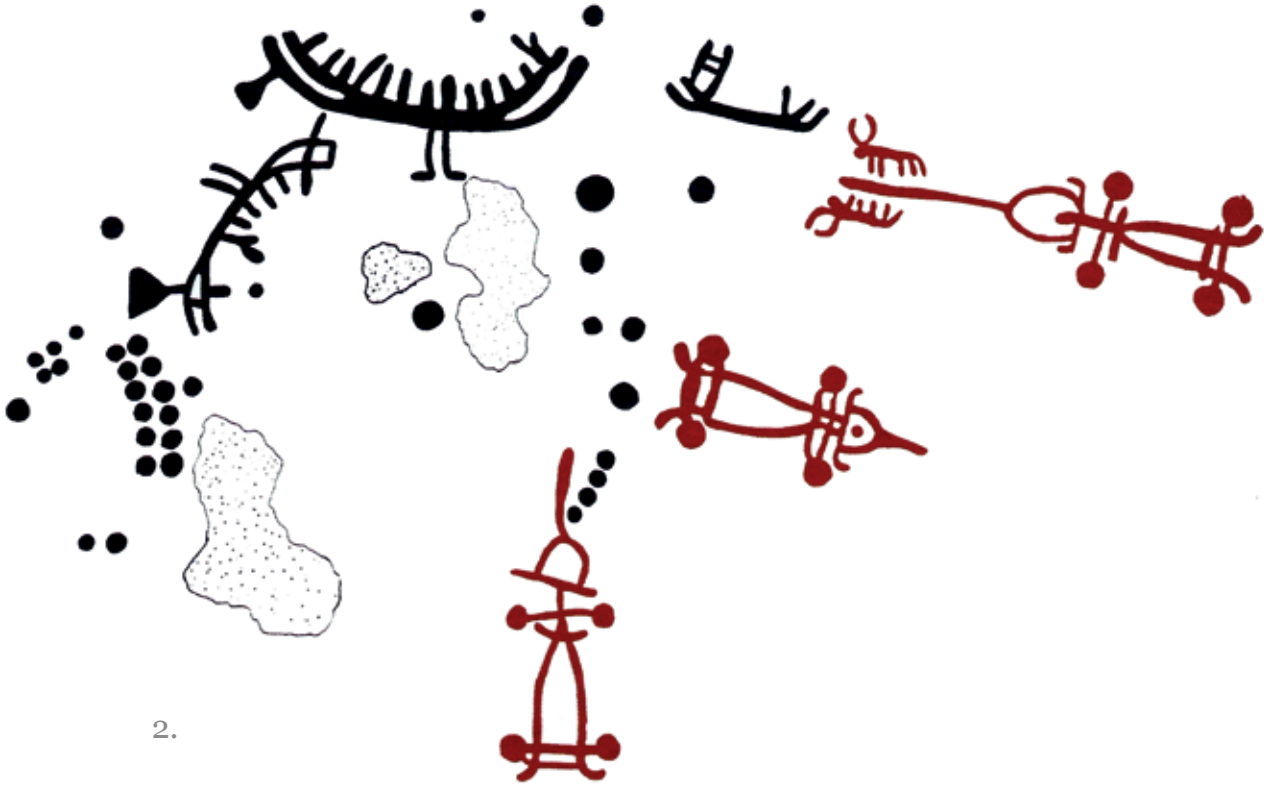
9.2. Italy. Val Camonica. Found were thousands of rock art images of different historical periods. For several decades, re-

search works are being conducted by Professor E. Anati of the Antiquities Study Center (Capo di Ponte), thanks to whom the petroglyphs became known to a wider audience. A few types of wheeled carriages are present among the Camonica petroglyphs.

Two-wheeled: a chariot without draught animals (9.2.Km1) is pecked on a separate surface, behind it is a man shown with arms apart sideways, next to him is a circle with a central dot and an unidentified figure [Anati, 1960, p. 53, fig.6]. Another surface shows the gig (9.2. Km2), drawn by two horses, surrounded by male figures with hands raised sideways. Next to them are circles [Anati, 1960, p. 53, fig 7].

Four-wheeled: in a place Kemmo, on the surface 2, engraved is an image of a cart (9.2. Km3), drawn by oxen, with an-

1.



2.

Fig. 34. Scandinavia. Bohuslan Province. 1 – Brastad; 2 – Askum. [Larsson, 2004, s. 389, 397, abb. 10,22].

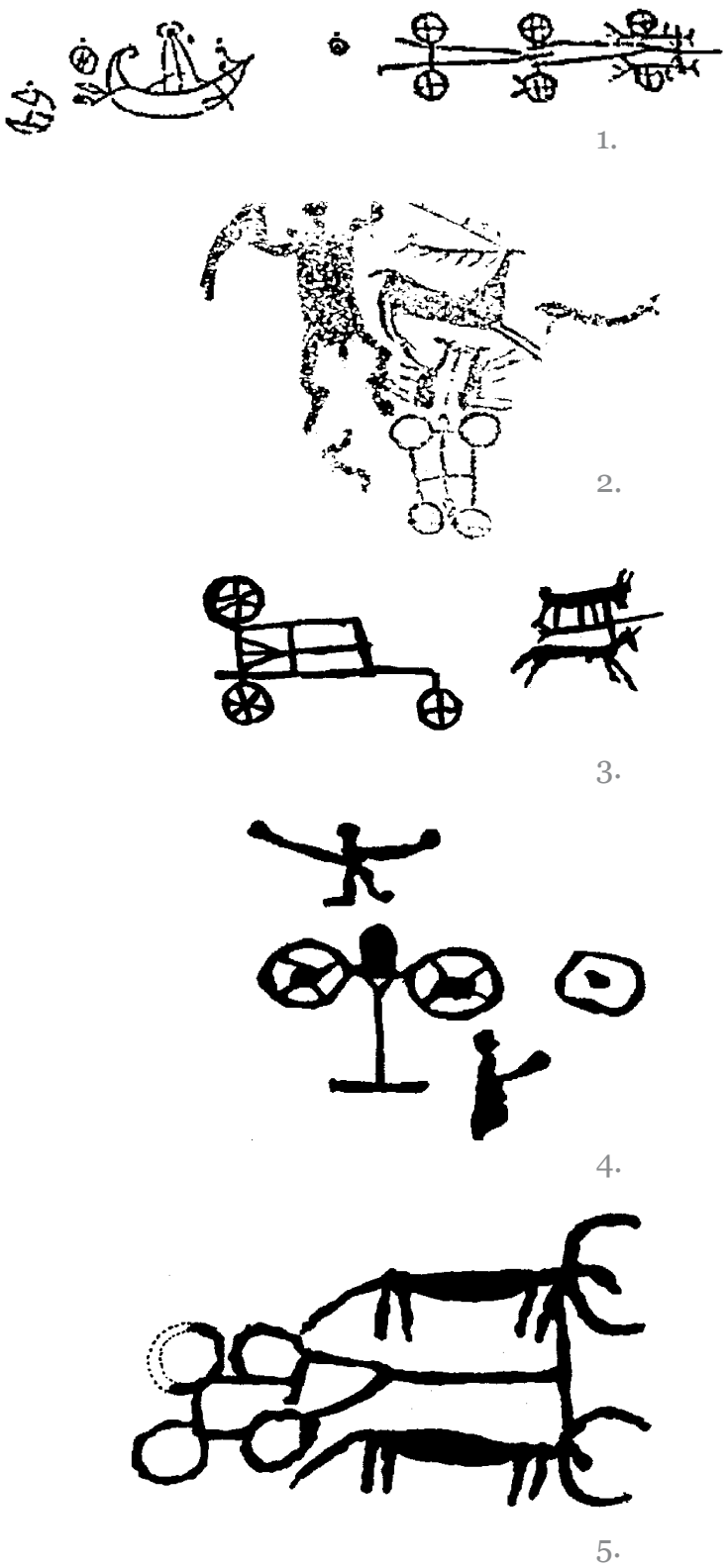


Fig. 35. Mediterranean. Images of the vehicles: 1 – Kavala, Greece;, 2-5 – Val Camonica, Italy [Anati, 1976; Piggott, 1983].

other pair of harnessed oxen below; the cart is poorly shown. There are numerous human figures with hands and legs apart, mountain goats, unspecified animals and daggers are in the right side of the surface. Above is the solar sign and two axes [Anati, 1975; Piggott 1983, fig.21; Muller-Karpe 1974, taf. 441-13]. On a separate surface, there is a cart drawn by a pair of animals of uncertain type, surrounded by unclear figures. There are two pairs of human feet imprints below the cart [Muller-Karpe 1974, taf. 441-1]. Cart images are known in other parts of the valley [Anati, 1976, p. 117,123, fig. 108.123] and on stelae (9.2.Km4-10). All vehicles of this type have a rectangular body and disc wheels. They were dated to the phase IIIA, which corresponds to the end of the 3rd millennium BC [Anati, 1975, 1976].

9.3. Sahara. Several thousand years ago this area was a flourishing savannah, its landscape similar to natural and geographicalal conditions of the Great Eurasian steppe belt.

Tassili-Adger. Multi-figured polychrome rock frescoes were discovered by the French expedition led by Lot on the Tassili-Adger plateau in the Atlas Mountains [1973, 1984]. Among paintings of different times are carriages of only one type, chariots (9.3.Ts1-14; 9.3. Sh1-2).

When harnessed by horses, the carriage is shown «in profile» (with an exception), always driven by a charioteer with reins in one hand and an ax, a whip or a goad in the other. With flying horses, fixed charioteers' posture, the whole image clearly conveys the idea of mobility and maneuverability of the carriage. The images are part of compositions of many humans and animals. In two cases, chariots are pulled by a bull. A draught-pole is curved and fixed on animal's withers; vehicles are given in such a perspective as to show the rectangular platform and two spoked wheels. The animals' pose is static [Hayen, 1986,

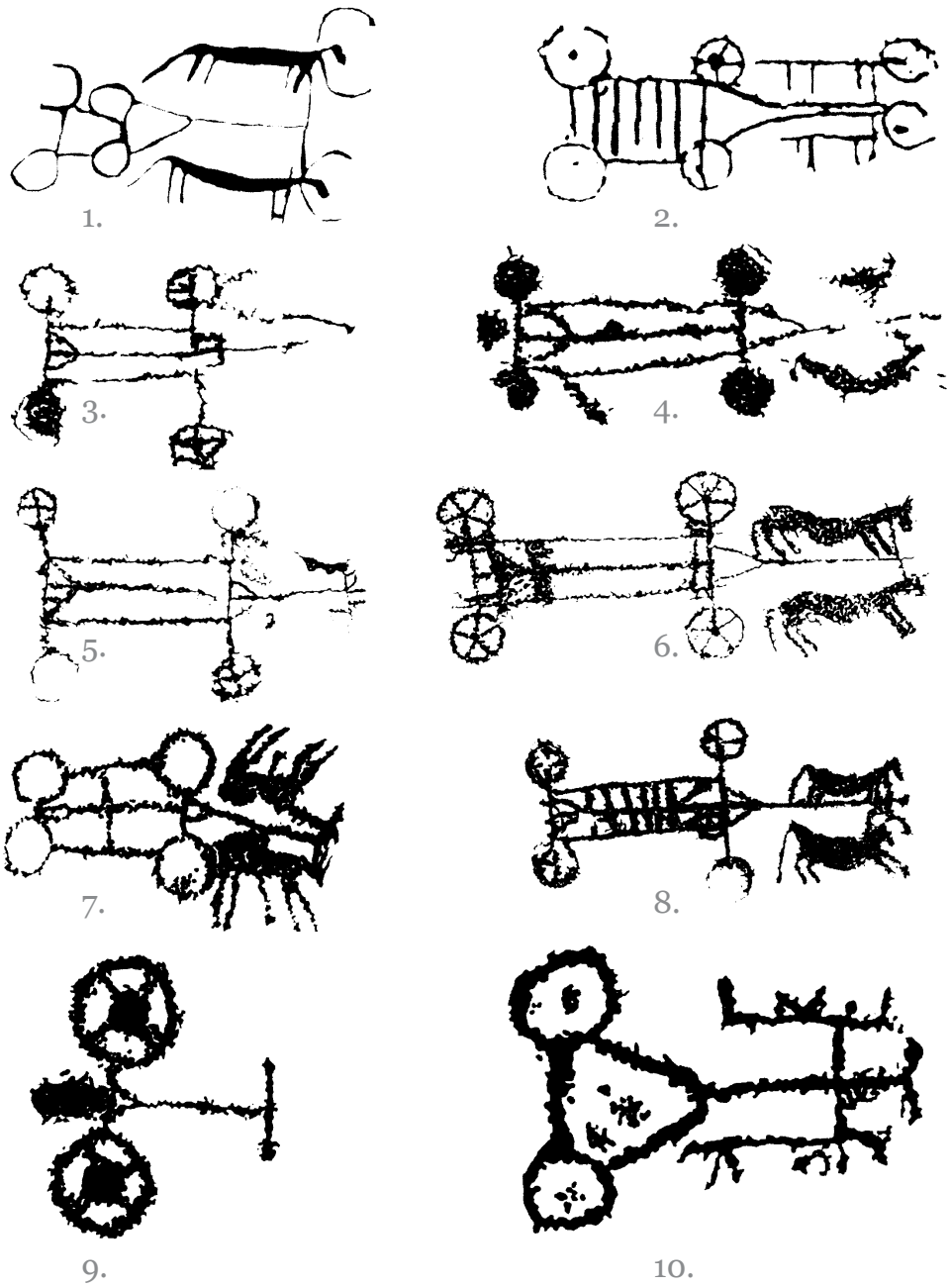


Fig. 36. Mediterranean. Val Camonica and South Tyrol. 1 – Kemmo 2; 2 – Lagundo (Meran); 3,9 – Nakuane; 10 – Campania [Zushner, 2004, s. 406, abb. 8].

s.80-84]. Vehicle images are present in other parts of Sahara [Mirimanov, 1973, p. 248; Trost, 1981].

Transcaucasia (8, Fig. 40)

It is quite conditional term, which covers the Caucasus Mountains, the territory of the Transcaucasia and adjoining steppe regions.

8.1. Northern coasts of the Black Sea. Kamennaya Mogila, in vicinity of Melitopol city. Registered were three types of vehicles: a chariot in profile with an explicit wheel and a trapezoid body (plate 27), and two types of bull harnesses in plan: pulling a scraper or gigs (8.1. KM1-4). [Cherednichenko, 1976, p. 138, fig. 2.4; Mikhailov, 2005, p. 181 – 185].

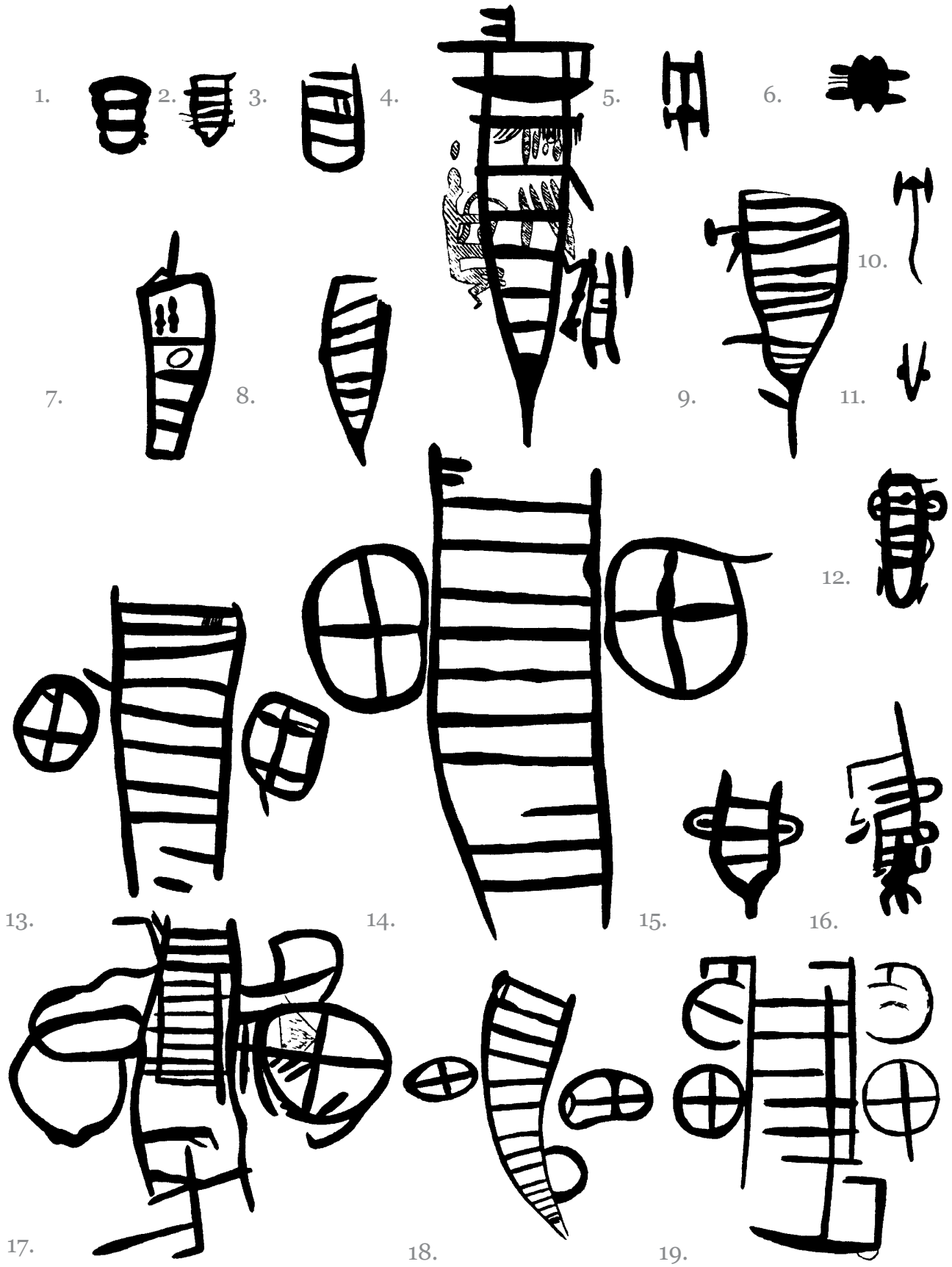


Fig. 37. Mediterranean. Southern Spain. 1, 3 – Nuestra Senora del Castillio, fels 3; 2, 10, 15-16 – Los Buitres, fels 5; 5, 6, 8-9, 12-14, 17-19 – Los Buitres, fels 10 [Zushner, 2004, s. 403, abb. 6].

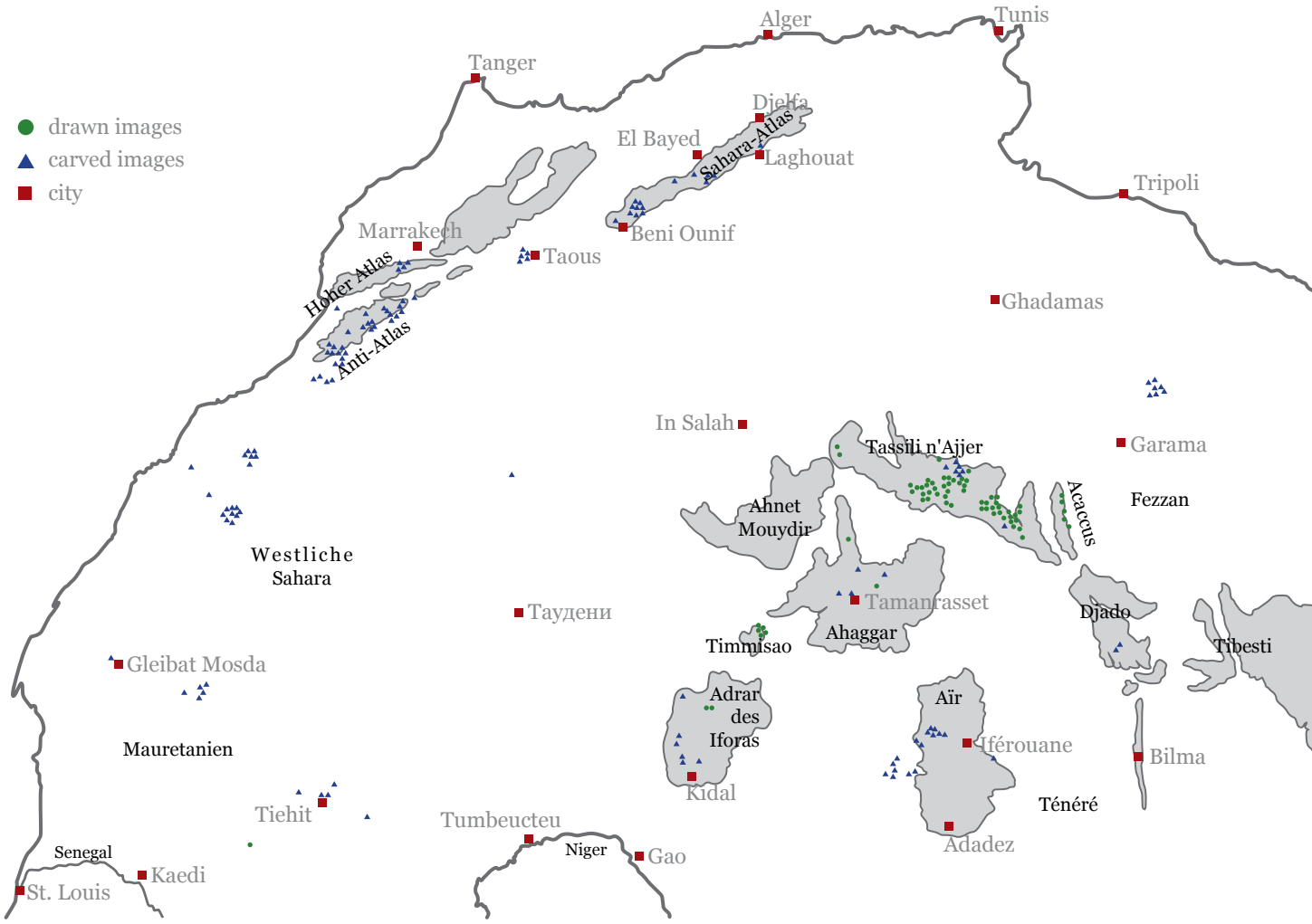


Fig. 38. Mediterranean. Sahara. Map of monuments. [Striedter, 2004, s. 159, abb. 1].

8.2. Transcaucasia, Gobustan. It is situated between the south-eastern spurs of the Big Caucasus range and the Caspian Sea. The petroglyphs are concentrated in groups on mountain slopes of Beyukdash, Kichikdash, Dzhingirdag and Yazyly Tepe. 700 rocky outcrops and boulders contain more than 4000 images, inscriptions, signs. These are pecked images of bulls, goats, horses, dogs, women, men-archers, etc., and group of images painted with ochre. [Muradova, Rustamov, 1986].

Stone 55. Yazyly Tepe. An engraved image of a single A-shaped chariot without draught animals (8.2.Go1), [Jafarzade, 1973; Muradova, Rustamov, 1986, p. 8-25, Aliyev, 2005].

Gemigaya. It is a mythological (the legend of Noah's ark) name of the Kapydzhik highest mountain in the Small Caucasus, 60 km north of Ordubad. There are over a thousand of fixed petroglyphs of single figures (humans, deers, oxen, mountain goats, dogs, fantastic animals) and their compositions (hunting scenes, ritual dances, etc.) on the southern slope, at 3500-3700 m asl. One of the surfaces contains four images of gigs drawn by animals of unclear type (8.2.Ge1). [Aliev, 1985, p. 3-15, Fig. 16].

Syunik. Gemigaya mountains. In Ukhtasar and Dzhermadzhur, 30 km from the Sisian village, at 3300 m asl, revealed were several thousand surfaces with images of different times, including more than 70 images of various vehicles [Karakhanyan, Safyan, 1970]. Aggregates of petroglyphs, including vehicle images, were fixed in vicinity to volcanic cones of the Small and the Big Paytasara, Ziarat, Sheikhi, Chingal and others [Martirosyan, 1981].

Fig. 39. Mediterranean. Sahara. 1 – Tamajert (Tassili n'Ajjer, Algeria), 2 – El-Rhallouya, Dhar Adrar, Mauritania, 3 – Arkana (Djado Plateau, Niger) [Striedter, 2004, s. 160-164, abb. 2, 6, 10].

Upon analysis of the images and the findings of vehicle from graves in the area, St. Piggott identified several types of vehicles from among the Syunik petroglyphs [Piggott, 1983, p. 78-83, fig. 7]:

• scrapers without wheels drawn by oxen, similar to rock engravings of Penalsordo (Spain), the Fontanalba valley (Ligurian Alps) and of Kamennaya Mogila (8.2. Su1-6, Figure 40).

Four types of vehicles:

• with a rectangular body and large disk wheels (8.2. Su7-19);

• with a rectangular body and large spoked wheels (8.2. Su20);

• with a rectangular body and very small disc wheels (8.2. Su21-44);

• «A»-shaped carts on disk wheels (8.2.Su41, 45).

Three types of gigs:

• with a rectangular body and disc wheels (8.2.Su46-51);

• «A»-shaped, on disc wheels (8.2.Su53-54);

• «A»-shaped, on spoked wheels (8.2.Su52).

A chariot type was identified, its images are considered in a special paper (8.2. Su55-64) [Littauer, 1977, p. 243-262, fig. 1-7, based on the comments: Piggott,

Fig. 39 A. Mediterranean. Sahara. 1 – Wadi Aramat (Tassili n'Ajjer, Libya), 2 – Wan Tabarakat (Tadrart, Algeria), 3 – Arkana (Djado Plateau, Niger), 4-Iwelen (Air, Niger) [Striedter, 2004, s. 160-162, abb. 3,4,5,7].

1983, p. 103-104]. Unclassified image: 8.2. Su65-70.

I should add here the petroglyphs from the eastern part of the Apsheron Peninsula, located on the most convenient route along the Caspian coast on the way from Mesopotamia to the steppes of Eurasia. It allows imagining the routes of ancient population migrating from Mesopotamia via the Caucasus Range to the northern foothills and steppes [Aliyev 2005, p. 25 – 27].

Petroglyphs of the taiga zone of Asia (7) are known from works by A.P. Okladnikov and members of his expedition team [Okladnikov, Zaporozhskaya, 1969, 1970, 1972; Okladnikov, 1971]. Rock drawings of vehicles found here differ from the petroglyphs found in other parts of Eurasia [Devlet, 1988, p. 54-83], which is obviously due to a different type of habitat. Rock images of vehicles of ancient historical periods, synchronous to Okunevo or Karasu cultures are unknown here. Engraved vehicles of later time were found on banks of the Chulym River, an Ob River tributary, in the place Kara-Ulus, on the Sulek Mount, [Ksica, 1974, s. 41, fig. e-4]. The engraved images of vehicles were found on the Selenga river, in places of Chana-Shuluun and Tabangutskoe obo [Ksica, 1974, s. 52, 1977]. ■

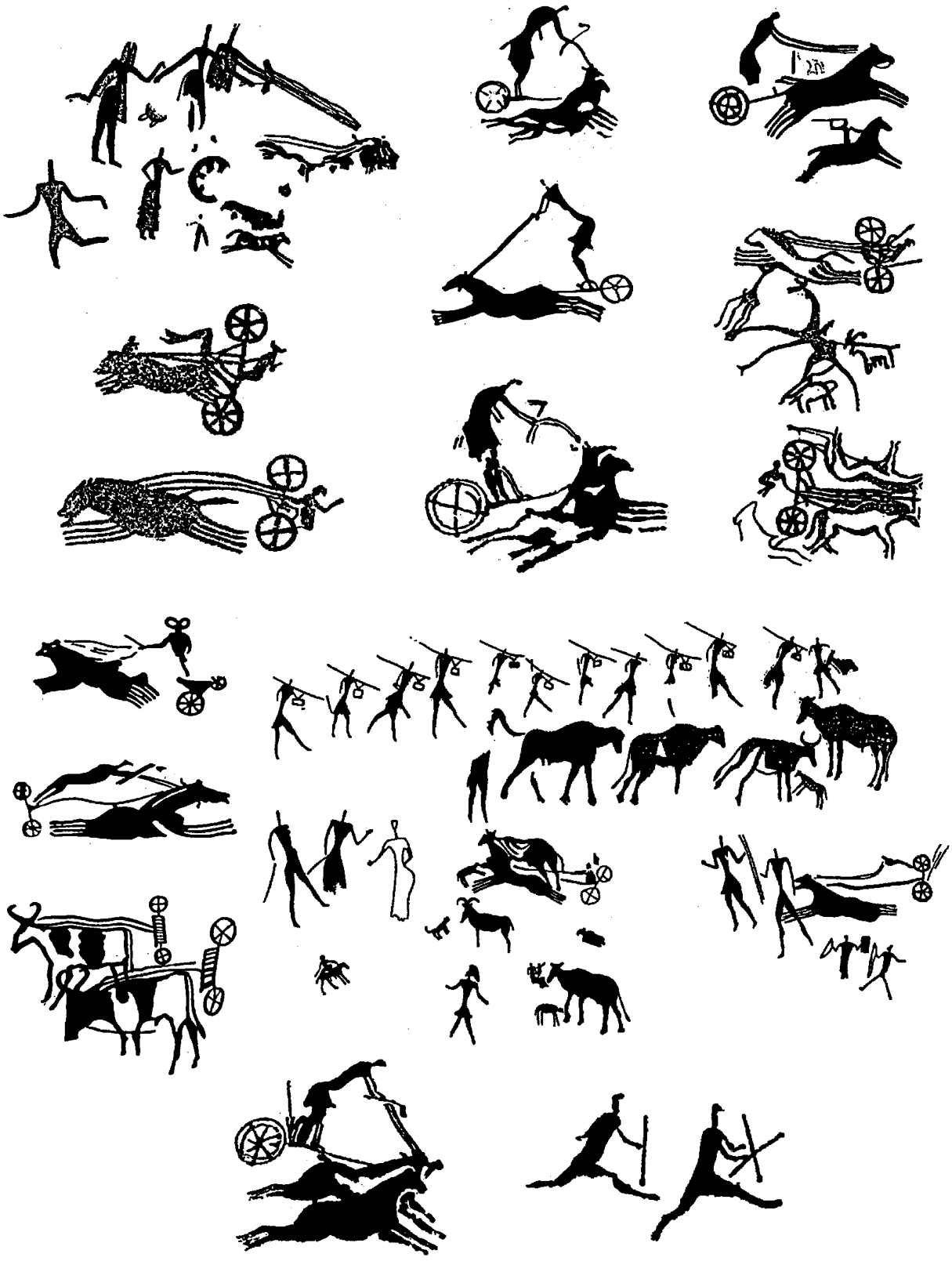


Fig. 39B. Sahara.Tassili's Frescoes. [Lot, 1973, 1984; Hayen, 1986, s. 83].

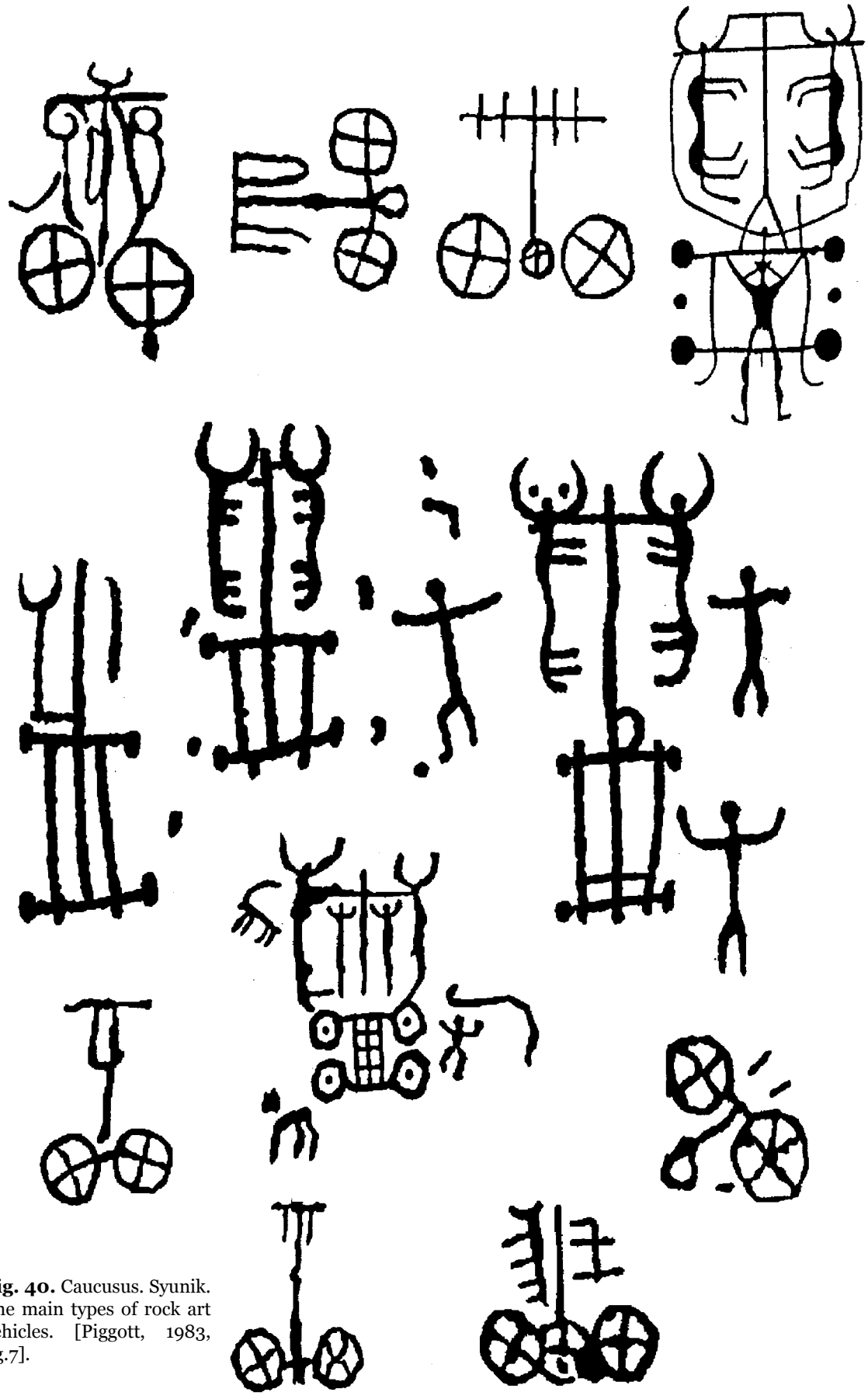


Fig. 40. Caucusus. Syunik. The main types of rock art vehicles. [Piggott, 1983, fig.7].

The general and the specific in the images of Asian carts

The current review includes images of vehicles found in more than seventy major locations of their aggregates in the following geographical regions: the Pamiro-Alai (1), the West Tien-Shan (2), the Inner Tien-Shan (3), the North Pre-Tyan-Shan (4), the Jungar Alatau (5), Tarbagatai (6.1), the Mountainous Altai (6.2), the Mongolian Altai and the Inner Mongolia (6.3-4), the West Sayan (6.5), the Minusinsk Basin (6.6). This regional division is very conditional, integrating in a number of cases, the vast adjacent areas. A full catalog of images and their detailed descriptions and features of monuments are given in Appendixes to this book. Visualization of all indicators utilized in the database is presented in the Appendix 1.

The biggest number of vehicles was registered in the Mountainous Altai, the West Tien-Shan, the Inner Tien-Shan and Mongolia. Depicted most often are chariots and gigs, rarely carts. Chariots in about same quantity are present in all regions, with domination in the Mountainous Altai and the West Tien-Shan. A similar situation is observed with gigs: the priority regions include Altai, Mongolia and the Inner Tien-Shan. The cart images are frequently met in the Minusinsk Basin, the West Tien-Shan and the Pre-Tyan-Shan.

Macro-topographic mapping and analysis of the monuments showed their location in places with rivers or water source, high in the mountains or at their foothills. Large monuments containing vehicle images were located along traditional caravan routes already in ethnographical times. Thus, Elangash is located on the ancient road to China, Thor is on the old Karakorum route to South India, Baikonur is on one of the branches of the Silk Road, Saimaly Tash is on the pass, part of the most convenient way to the fertile Fergana Valley. Thus, an assumption that the monuments with petroglyphs were used as an open air temples and that they indicate ancient trade routes active long before the start of operation of the great Silk Road, was confirmed.

At the level of microtopography, slabs with vehicle images were found in most archaic parts of the temples (Elangash) or nearby (Mugur-Sargol, Tamgaly), in secluded places and separate spurs (Baikonur, Tamgaly, Ching and others). More than half of all vehicles were recorded as part of some kind of narrative structures, or «a pictorial series.» Most of all, vehicle images are combined with an image of a mountain goat, which may be indicative of their mythological relationship. This is also true for images of a human and a dog-wolf. The vehicles are also combined with figures of oxen, camels, horses, masks, riders, and solar signs. Marked were combinations with images of human hands and feet. «The iconographic series» of vehicles is as follows:

vehicle > bull > mountain goat (deer) > dog > man (solar symbols);

for chariots:

chariot > horse > mountain goat (deer) > dog (wolf) > man (foot, hand, solar sign).

Topographic placement of the two sequences in the most informative and archaic «pictorial series» and in the «altar» of sanctuaries is a clear indication to their key importance as one of the main images in monuments' narrative structures and in corresponding decryption of ancient «messages».

Fixed changes in image combinations of «the pictorial series» on various monuments can testify the chronological differences of the very «pictorial series» and the differences in knowledge and views, which they describe.

One fourth of all considered images bear different damages which reduces the reliability of the conclusions, especially for monuments in the Minusinsk Basin and Tuva, survived in the worst condition.

The analysis of a vehicle image here is divided into three components: analysis of a design + of a driver + of draught animals.

Initially and conventionally, the entire array of images is divided in three groups: carts, gigs and chariots on the basis of two criteria: the number of wheels, and how a wheel is depicted in two-wheeled vehicles (with or without spokes). Among all indicators utilized in the descriptions, some steadily repeated groups are typical to each series. It is them that distinguish groups of images from each other. Let's consider these indicators in detail.

Carts. Images of this type are made predominantly in dotted pecking techniques, in plan, rarely «in profile». They are supplied with wheels of all types, with domination of disc wheels. The body is shown in contour lines, rectangular and, rarely, rounded. Vans constitute the fourth part of images. An axis of figures 'in plan' is rather short than long. The draught-pole method of harnessing prevails and is either of an «A»-shaped or a straight one, rarely combined or curved with a crossbar and a yokes-saddle. Every fourth image shows reins extending from a head of a draught animal, rarely accompanied by figures of charioteers.

Gigs. Images are made in dotted pecking, very rarely in thin carvings; ochre paintings happen occasionally, shown in solid or contour pecking; other types of wheels are rarely present. There are covered gigs. Most of vehicles have platforms in contour lines, rarely in silhouette; «D»-shaped and round platform dominate. A platform is often shown over or in front of the axle than behind it. An axis is either long or short; naves are seldom shown as projections. The vast majority of vehicles has a central direct draught-pole; «A»-shaped or curved draught-poles are rare. More than half of the images are shown with a draught-pole crossbar, the fourth part is with the yoke-saddles and reins. The vehicles expose some features of their design: a fourth part of the images has wheels of large diameter.

Chariots. Many of their features are in common with the gig type. Although, due to some indicators, chariots were individuated in a separate type: the wheels are always shown with spokes, in harnessing there is no shafts, the wheels are of large diameter and exceed the platform in size; often, number of spokes in the wheels is various; more often than with gigs, a charioteer is in place. He is shown in plan, often accompanied by a second person; there are more images where the charioteer is standing on the platform, with a «tail» (sometimes with a «ball» at its end), the sex sign is emphasized; with a bow or a whip in his hands. Most typical for chariots are horse harnesses, back to back; in a quarter of cases, animals are shown placed one above the other, or separately from the vehicle.

Charioteer(s). As a rule, is shown together with chariots and vehicles, in such locations as the Pamiro-Alai, the West and

the Inner Tien-Shan, in the Altai and Mongolia. In other regions, such combinations either absent at all, or have an individual character. Local cases vary in ratio of pictures of a charioteer with and without vehicles. The charioteer is often depicted standing straight, feet apart, arms down straight or bent, the body of a rectangular silhouette with distinct waist and nose. The head is often depicted with the halo of rays.

In Eurasian petroglyphs, images of «the sun-head» have a very broad geography and an ancient tradition. Gig drivers mostly shown in plan, walking behind the vehicle or standing on it. Their image includes an emphasized sex sign, a whip or a goad in his hand.

Draught animals. In contrast to charioteers, figures of animals are depicted together with vehicles in all geographical regions, but numbers of harnessed and unharnessed vehicles vary. In the Pamiro-Alai, the Inner Tien-Shan, the Pre-Tyan-Shan, the Jungarian Alatau and the Altai, actually all vehicles are shown harnessed. Approximately half of the image in the West Tien-Shan, Tarbagatai, Mongolia, Tuva and Khakassia are unharnessed vehicles. The horse teams prevail (gigs are drawn by oxen or camels). The animals are depicted with two or four legs in a static position, rarely moving, or legs beveled in front. Animal body is often massive, without waist, in silhouette pecking. The head is rather elongated and triangular than round, square and short. Animals pulling carts are often camels, rarely bulls or horses. Draught animals pulling gigs are often depicted back to back, rather than one above the other, or aside from the vehicles.

About half of the images are gigs with draught animals, shown with ears, rarely with a mouth, hooves, a projection on withers, the phallus, and a horse mane.

Thus, each vehicle image is described by three groups of indicators:

- a vehicle's structural elements;
- the figure of charioteers;
- draught animals.

The next feature group describes the above elements in a particular image. Different combinations of the features at two levels reliably determine the main typology groups.

The vehicle design (C):

> Number of wheels shown (4,2,1)> The wheel (W): disk (d); cross-bars (cr); spokes are shown (sp); large (lg); small (sm)> Draught-pole (DP) or Shafts (SH): «A»-shaped (af); «Y»-shaped (yf); curved (cr); direct (sf); combined (mix); «multypoles» (mul)> yoke in the form of cross (Y): yoke-saddle (ys); braces (br)> Axis of vehicles (AX): long (lg); short (sh); shows the nave (s)> Body of vehicles (BX): open (op); van (vn); shown in contour (cn); shown in «silhouette» (sh); «D»-shaped (df); round (rnf); rectangular (rf); the reins shown (rs)> ***Driver (DR):*** number of images: (1,2,3), sitting (s); standing on vehicle (st); walking behind vehicle (wl); shown in plan (pl); shown «in profile» (pr); attributes shown: weapon, whip, goad, «tail», «horns» (at), a sex sign (sex)> ***Draught animals (DA):*** number of animals (1, 2, 3, 4) ; arranged back to back (bb); legs to legs (ll); one above the other (ss); separate from the vehicle (sp); details shown: ears, mane (at); sex sign (sex); different animals in one harness («a miraculous team») – (dif).

Each of consistently and persistently occurring versions in a mutual combination of the above indicators form a unique identification code made of numbers and letters above:

C> W> DP> Y> AX> BX> (DR> DA), similar to the VIN-code in modern cars, which allows a car owner and customer services to get all the necessary data on production, kitting features of a car, etc. ■

Typology, the purpose and a «style» features

Visualization of the entire array of data in form of charts made it possible to single out of all the utilized attributes the definitive substantive indicators which describe a design of vehicles and their changes, innovations applied and development stages in a designer's thinking. In a lesser degree, these indicators reflect manners in depicting typical structural components, their relative positions in a particular image, and rather define certain stages in the evolution of a given invention. Certainly, execution manners had always a hidden artistic and an imaginative motive behind and do not intent to «photographically» capture parts of real vehicles, but these indicators seem to be more reliable in building up a typology of vehicles. The singled out types can be accepted only after their comparison with the remains of actual vehicles, found in the ancient graves.

However, particular interpretations of a vehicle image (an expression plan), indicators for canonization of an image (schematizations, simplifications, substitutions according to the principle «pars pro toto»), in a word, all notable iconographic differences allow us to determine some features of a local (regional) «style». The term «style» I deliberately enclose in quotation marks because of the fact that the analysis of a regional style, as such, for the entire repertoire of petroglyphs of a given region requires a significant expansion of the scope

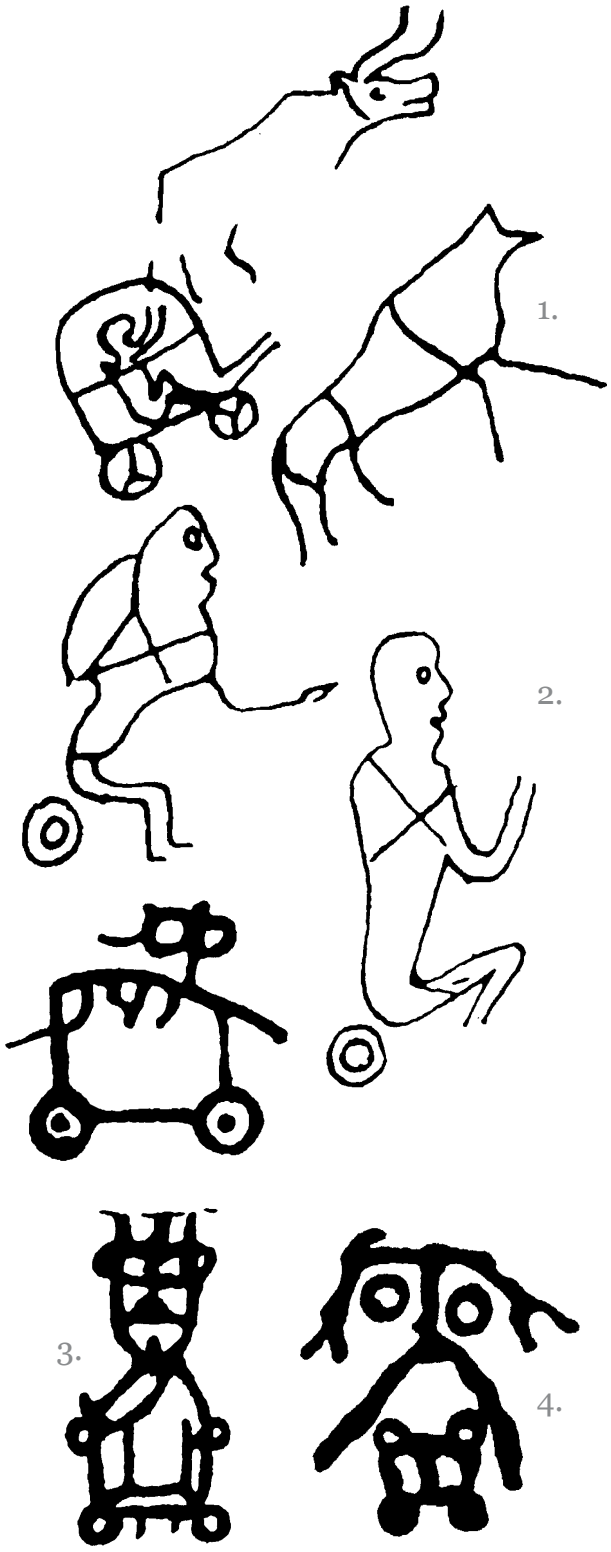


Fig. 41. Wagons. 1 – Znamenka 2 – Chernovaya 8; 3 – Tunchuh (Y.N. Esin, when re-examinated Tunchuhskaya pisanitsa does not confirm the presence of these images of vehicles on the rocks [Esin, 2011], 4 – Ust Tuba 2. [Devlet, Devlet, 2004, p. 238, fig. 1].

of the study, and takes us away from its main object. This means only an identification of a set of iconographic features in relation to images of vehicles. Obviously, elements of an image associated with a design of a vehicle are less subject to the «artistic processing», while figures associated with a charioteer and draught animals are subject in greater degree.

The proposed classification is based on technological changes in the design of various types of vehicles in combinations with figures of draught animals and a charioteer.

Carts, type C4Wd (cr, sp) (Fig. 41-43). This type of vehicles is represented by two-axle carriages forming four subtypes and their variants.

Subtype 1: C4Wd (cr) DPsfAXsBXvn, c (DR1s, prDA2ss, sp). Profile vans are covered wagon on disc / cross-bar wheels. A nave / an axis as dots are shown in the center of the wheel. On the Znamenskaya stele, a man sitting in a van and a team of harnessed bulls are depicted. A deity (?) mounts also a Tunchuh vehicle. Here, as in the Ust-Tubin vehicle, an attempt was made to portray a cart in plan. This subtype vehicles are similar to the early Near East covered vehicles with a seated charioteer and to the covered carts with an «A»-shaped draught-pole from the mound 2 of the Lchashen burial ground, Armenia, similar in design to carts found in the Catacomb and the Pit's graves. An image of a «boat-shaped» cart could be viewed as a variant of profile vans (6.6.UB.1). Its image was detected only in the Minusinsk Basin.

Such images are characterized by the unique profile projection, and, on the surface, a vehicle is positioned in a distance from figures of draught animals, which could be absent at all. The wheels are always of a disc or lightweight type. Design details are not elaborated; images are made in contour lines.

Subtype 2: C4Wd, smDPsfYysAXlgBXop, rf, rs (DR1st, prDA2ss, at, dif). Platform vehicles. Always shown with an open body

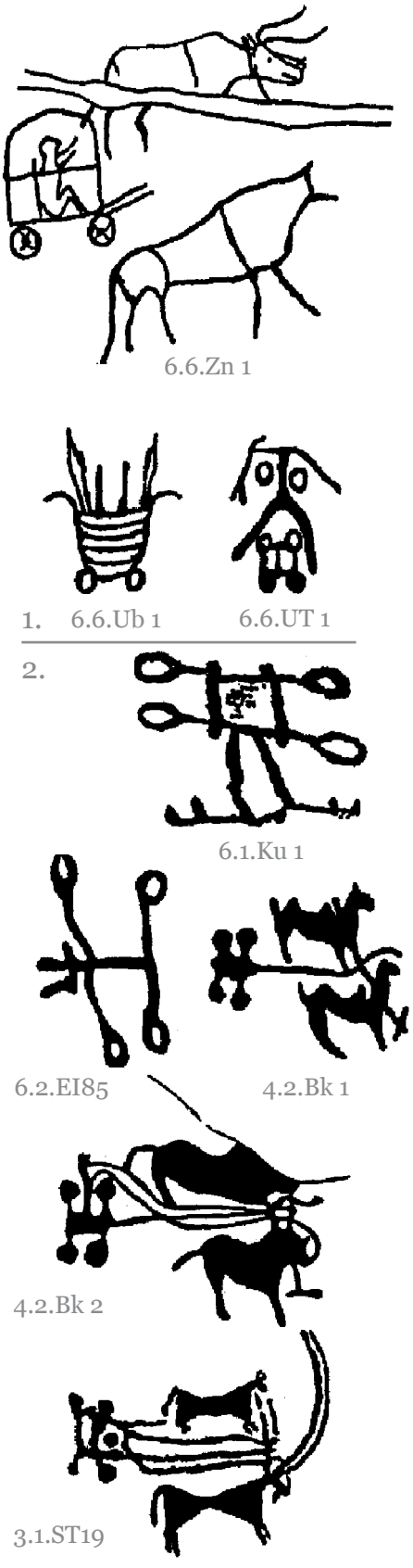
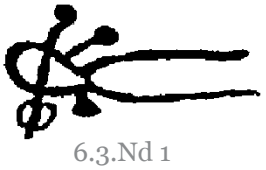
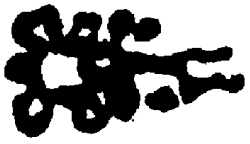


Fig. 41. Wagons. Subtypes 1 and 2.

of rectangular form, perhaps, of a cage structure, with disc wheels of small diameter on the long axis. The central draught-pole is in the form of either one straight bar or two parallel ones (6.1.Ku.1), supplied with a crossbar. The harness is by a pair of camels, horses, or a mixed pair made of a bull and an argali. The crossbar serves as a common yoke and is fastened by rawhide straps at the shoulder level of camels, or under the head of horses, similar to the method known from the Saharan murals [Spruytte, 1983, p. 78-79]. An image of the yoke-saddle depicted on a crossbar was encountered once. Reins extended from the animal's head in a single line were depicted twice. Perhaps, this is indicative of steering an animal by a nose ring rather than with psalii and organic bits. A charioteer drove the vehicle, standing on its body. Vehicles of this subtype were detected in the Kazakh low hills, Tarbagatai, the Inner Tien-Shan and the Altai, are well represented in the petroglyphs of Armenia. (8.2.Su.21-44). The subtype is featured by depiction of a vehicle in plan and of draught animals and a charioteer in profile. Disc wheels and a rectangular platform are shown by solid contour pecking; the harness details are well elaborated.

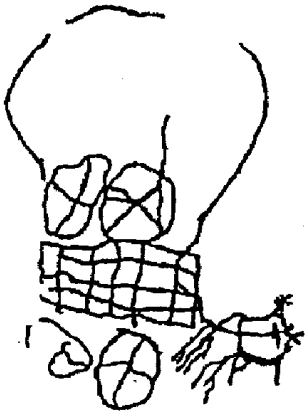
Subtype 3: C4Wd (sp), smDPmix YAX-BXop, rs (DRDA1, 2ss, sp). Carts on small disc wheels, with a combined draught-pole or shafts. Their version is represented by a vehicle on spoked wheels. A platform is a rectangular, rare, rounded. An original combined central draught-pole is in use, dividing in two short shafts, which embrace the back of a camel, one harnessed animal. The draught-pole could be fastened between the humps by rawhide straps. (2.2.Ko.26; 2.2.Ar.3.) Most likely, it was an intermediate step before an invention of the shafts method. This subtype of vehicles utilizes one animal, either a camel or a horse; two types of wheels, a disc and a spoked one. The Tamgaly cart is depicted either with shafts or with double draught-pole similar to that of a Kurchum cart. Their design is based on an open platform with an additional canopy (5.1.EO.3).

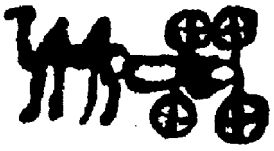

6.3.Nd 1


2.2.Ko26


4.1.Tg2


2.2.Ar 5


5.1.EO 3


2.2.Ar 3


2.2.Ko 16

Fig.42. Wagons. Subtype 3.

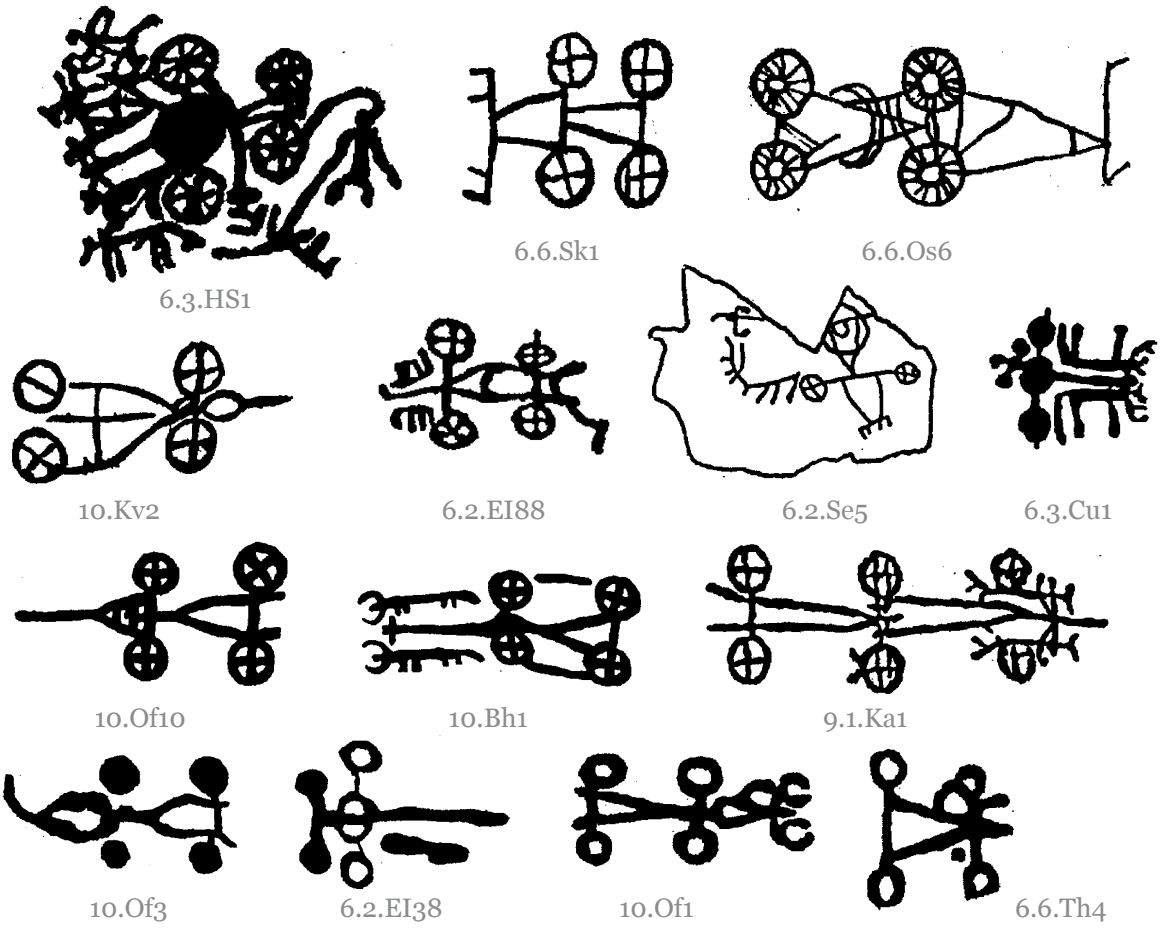


Fig. 43. Articulated wagons. Subtype 4.

Geographically, they are common in Mongolia, Karatau, the North Pre-Tyan-Shan and the Jungarian Alatau. The vehicle is shown in plan, without or with one harnessed draught animal always depicted in profile. Disc wheels are conveyed by a solid and contour pecking; carving is in use too. Construction details are well elaborated.

Subtype 4: C4Wd (sp) DPaf, cf, YysAXBXop (DRDA0, 1, 2, 4, sp). Articulated carts are singled out in two ways:

4.1. A variant of spoked wheels;

4.2. A variant of disc wheels.

These are two chariots or two gigs linked together. Towed vehicles usually have an «A»-shaped draught-pole and by themselves constitute a subtype of the «A»-shaped gigs on disc wheels (subtype 1, Version 1.1), and a corresponding subtype 1 of chariots (see below).

The connecting block was flexible, as witnessed in depiction of the non-parallel axes of Mongol vehicles (6.3.HS.1; 6.3.Cu.1). Such a vehicle should be more maneuverable than four-wheel vehicles with a front axis fixed horizontally, turning which was possible only on a large arc. The front vehicle of the coupling had an «A»-shaped or a straight draught-pole with or without the crossbar-yoke. The yoke-saddles were fixed in four cases. Draught animals are horses or oxen (in Scandinavia). There are variants for fixing of draught-poles to draught animals: using individual yoke-saddles put on withers, on the

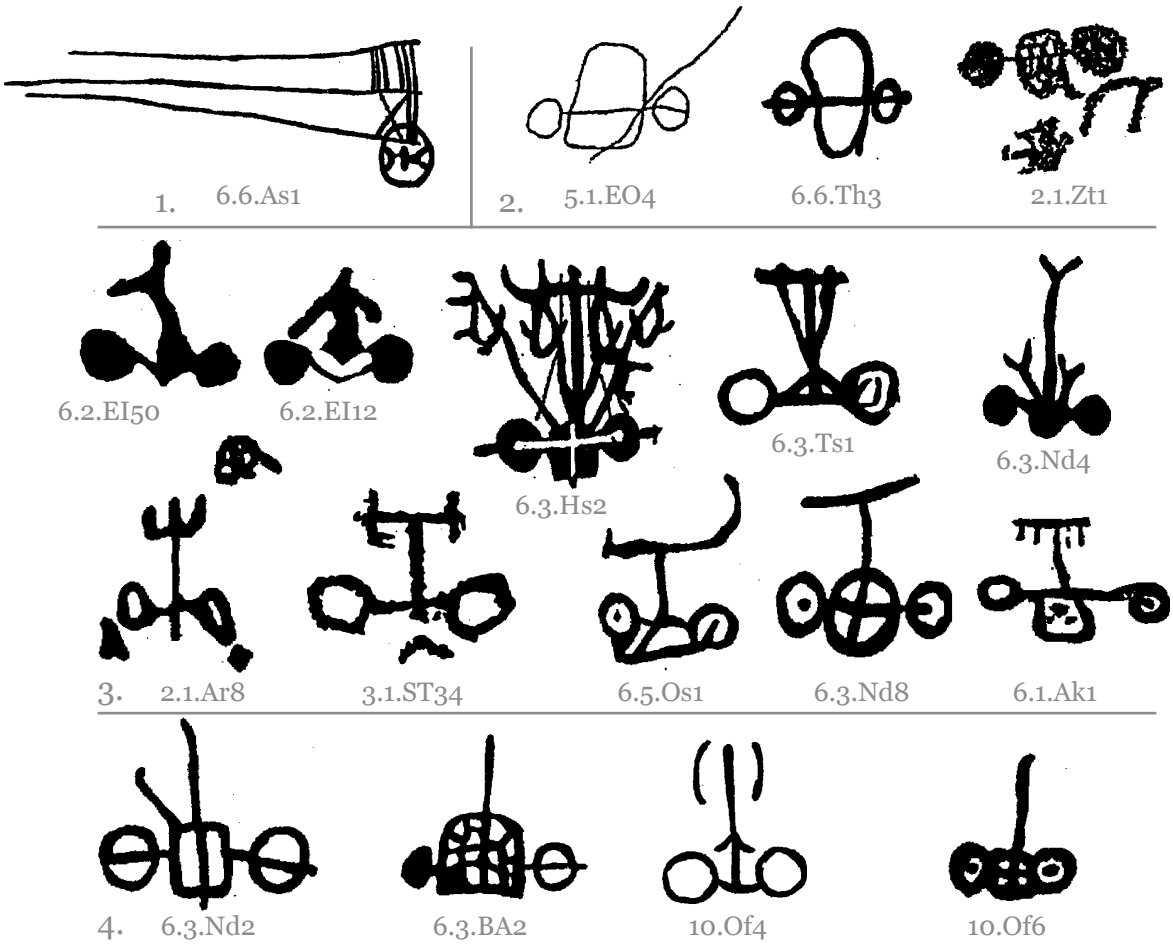


Fig. 44. Gigs. 1 – subtype 1; 2 – subtype 3; 3 – 3 subtype, version 3.2; 4 – 3 subtype, version 3.3.

back, or with help of leather shoulder yokes. Found in Mongolia, the Minusinsk Basin, and in the Altai.

A substantial number of the images series is represented in the petroglyphs in Northern Europe and the Mediterranean. This subtype carts were most often portrayed unharnessed and in plan. In Mongolia and the Altai the carts are with harnessed horses (quadrigas, bigas). The trailer cart was portrayed somewhat smaller than the leading cart in Mongolia and the Altai. In the Minusinsk Basin, only carts with an «A»-shaped draught-pole were used.

Gigs, type C2Wd (cr) (Fig. 44-47). This type of images is defined by the feature to show a vehicle wheel by solid or contour pecking, which is obviously connected to a need to emphasize a disk wheel. On the other hand, when moving, a chariot's spokes fuse into a single disk, and is also perceived as a solid wheel. Accordingly, such a «continuous» wheel is shown by the ancient artist on a rock in this particular way. Therefore, an attribution of some images is rather conditional, since the single-axis vehicles on disk wheels could perform in the real life of ancient societies the same functions as war chariots, which was the case, for example, with ancient Britons [Piggott, 1983, p. 11, fig. 1].

For this reason, the images were singled out in a separate subtype of the «gig-chariots». Arbitrary attribution of some images to

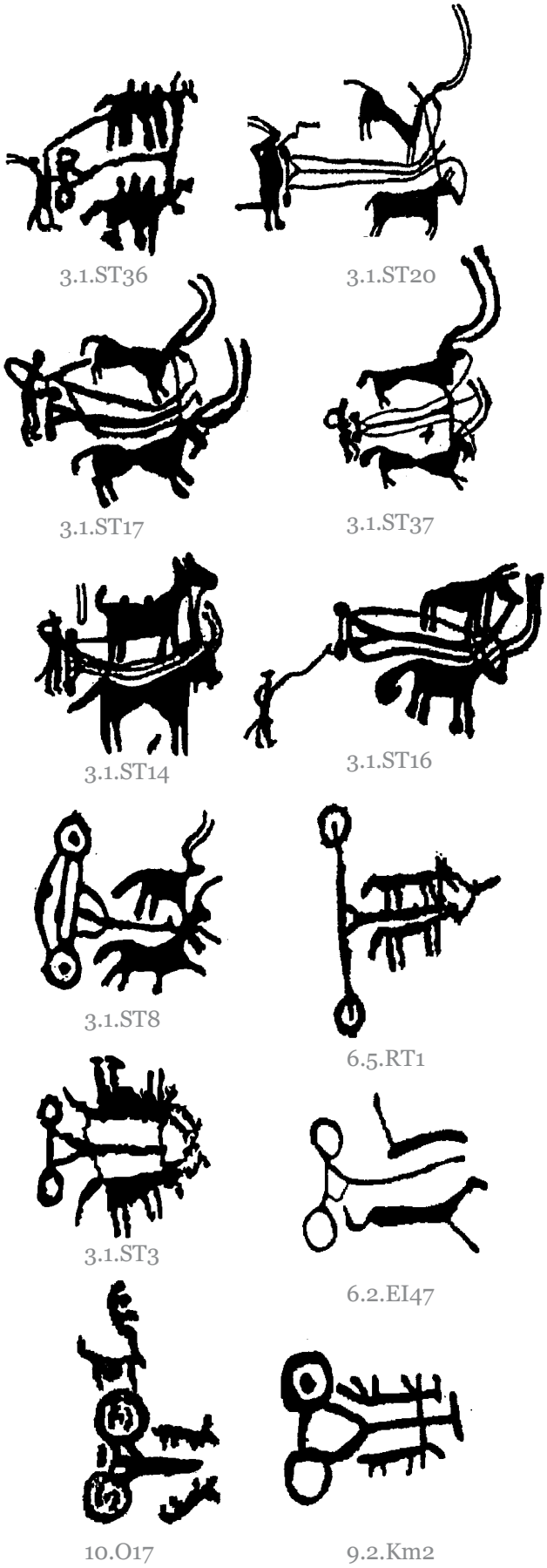


Fig. 45. Gigs on the small disk wheels. Subtype 2, version 2.1.

this subtype is conditioned by the nature of iconographic sources themselves, portraying style of which does not allow seeing the key design details. Described below are only those images which are clearly attributed to the gig type.

Subtype 1: C2Wd, sm (cr) DPaf? AXs? BXop, rf. Unharnessed gigs. The profile gig, with lightweight (cross-bar) wheels shown in the Askiz stele of the Minusinsk Basin. It is similar to images of the profile vans in the Znamenskaya stele and in the Tunchukh pisanitsa. The profile gigs, harnessed by oxen, driven by a sitting charioteer, were discovered in the valley of the Elangash river.

1.1 A variant of an «A»-shaped gig (see above).

Subtype 2: C2Wd, smDPyf (sf) YAXsBXrs (DR1wl, pr (pl) atDA2ss, dif). Gigs on tiny disc wheels (Figures 45-46). In the Altai, the vehicles were known since the ethnographic time; their local term is «medvedka» [Okladnikova, 1990, p. 126]. A vehicle of similar subtype was found in the Pazyryk burial mound.

2.1 A variant: a small-wheeled gig driven by a man walking behind the cart (Fig. 45); shown is a «Y»-shaped draught-pole, the fork of which is turned to wheels and could be a platform at the same time. The draught-pole is straight, with or without a crossbar. Often present are reins and a goad. The crossbar might be fastened under the heads of animals. Vehicles of this type were found in Saimaly-Tash, Tuva, Altai, and in Scandinavia. They are characterized by portraying the draught animals (horses, oxen, mountain goats (?) and camels) in profile and in mixed teams (except for the Altai and the Scandinavian vehicles). A charioteer is also depicted in profile, often with the halo around his head, with a «tail», in one case with the «ball» at its end. The wheels are shown by solid or contour pecking; shown is an axle or a nave.

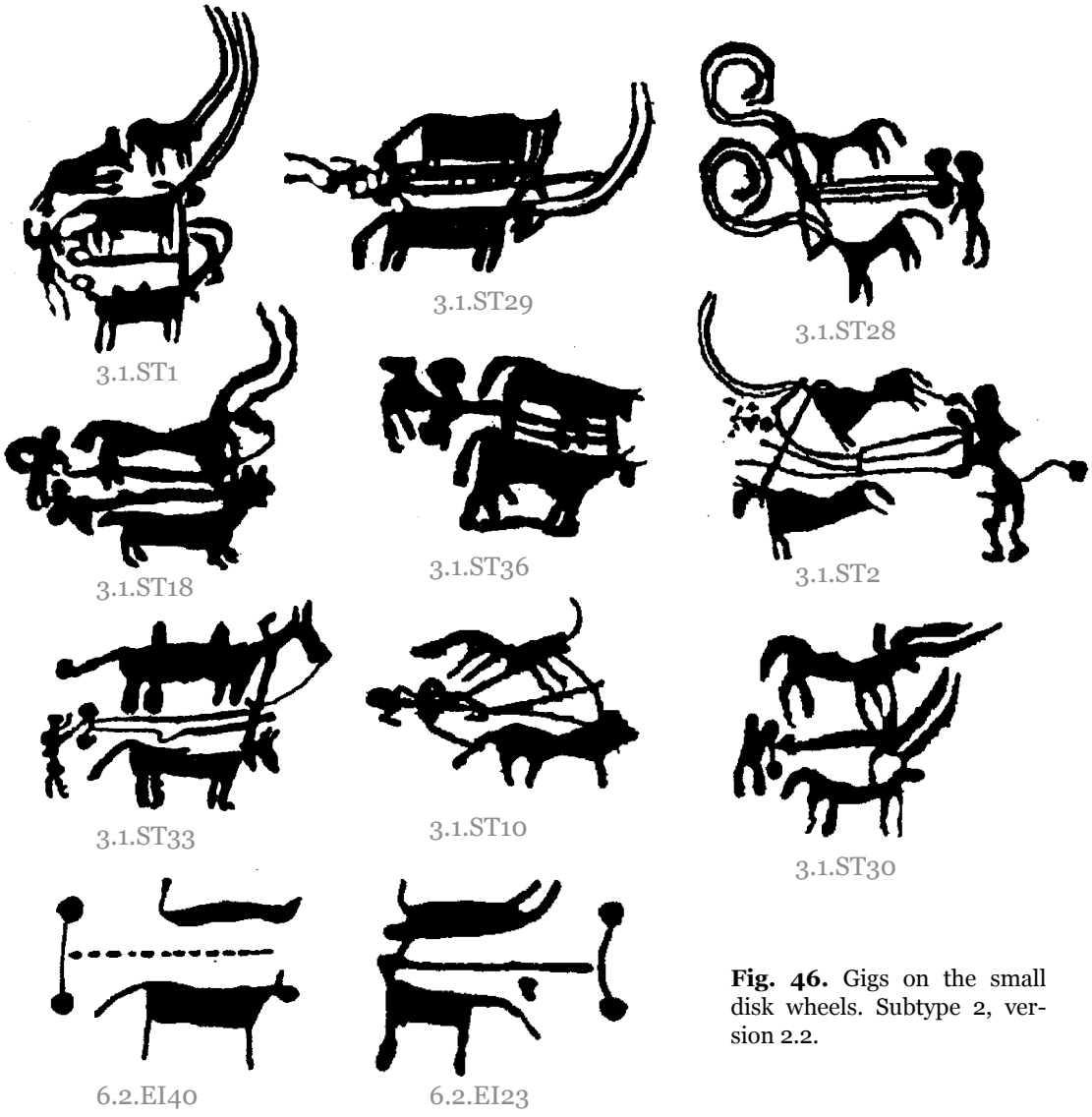


Fig. 46. Gigs on the small disk wheels. Subtype 2, version 2.2.

2.2 Another variant (Fig. 46) differs from the previous by absence of «Y»-shaped bifurcation; a charioteer, if depicted, is shown in plan, walking behind the gig; there are representations of a charioteer and animals in profile; available in petroglyphs of Saimaly-Tash and the river Koksu valley.

Subtype 3: C2WdDPstYys (br) AXs-BXop (cn, df, rnf). Unharnessed gig-chariots, a round platform (Fig. 44: 2, 3, 4); no draught-poles, wheels are of solid or contour pecking. Recorded in the Minusinsk Basin, the Jungarian Alatau and at the foothills of the West Tien-Shan.

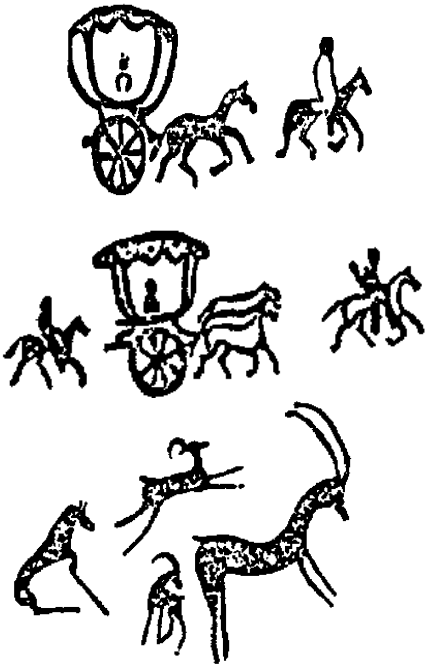
3.1 A variant: gigs without a draught-pole (Fig. 44:2). Found in the south of Kazakhstan.

3.2 A variant: gig-chariots with a crossbar-yoke (Fig. 44:3), sometimes shown with yoke-saddles (in two cases, the draught-pole crossbar is reinforced by braces). The platform is round, «D»-shaped or rectangular. The wheels are shown in solid and contour pecking. Emphasized is an axle or a nave. There are variants for fixing the yoke to draught animals. Found in Mongolia, Karatau, Tarbagatai, Tuva and Saimaly-Tash.

3.3 A variant: gig-chariots without a crossbar (Fig. 44:4) with a rectangular body on disc wheels, in plan, in contour line. Indicated are a nave or axle ends. Harnessing is only with use of leather straps, soft shoulder yokes or traces. Found in Mongolia and Scandinavia.

10.Bh2

7.1.SI1



6.3.YU

7.1.TO1

Fig. 47. Gigs in the profile projection. Subtype 4.

Subtype 4: C2WspSHDBXvn, rf ..... A group of images of covered gigs on spoked wheels, in profile, outstanding by the execution manner (Fig. 47), and apparently dates back to the Hun-Sarmatian epoch [Okladnikova, 1990, p. 123]. The type is very well known in China since the Han dynasty and in subsequent periods as the main and, perhaps, the only type of carriages (both passenger and cargo versions) until the latest period of history.

Chariots, type C2Wsp (d). (Fig. 48-60). This image type is characterized by a more complex, yet reliable and light design of the draught-pole system, the body and the spoked wheels. Draught animals are horses, harnessed in biga, triga and quadriga. In addition to design features, availability of draught animals and charioteers, their iconographic features determine further classification in sub-types.

Chariots were a much improved mechanism, manufacturing which required quite advanced craft technology and specific skills, for example, making of a curved wooden body parts and spoked wheels, using heat. For some of the ancient pastoral societies such technology could be unavailable.

Subtype 1: C2WspDPqfYysAXs-BXop. «A»-shaped chariots (Fig. 48) with a typical triangular shape draught-pole, which is at same time a platform of the vehicle. Pulling effort by draught animals was transmitted through the crossbar and the yoke-saddle, or by leather shoulder yokes. It is possible that the traces were also applied. In articulated vehicles, the main and trailer carriages were used. Geographically, an image of this subtype was spread in petroglyphs of Scandinavia, the Caspian region, the Minusinsk depression and Altai (on disc wheels), except for the Caucasus.

Subtype 2: C2WspDPsf (Yys) AXs BXrnf. Unharnessed chariots with the draught-pole crossbar were depicted with

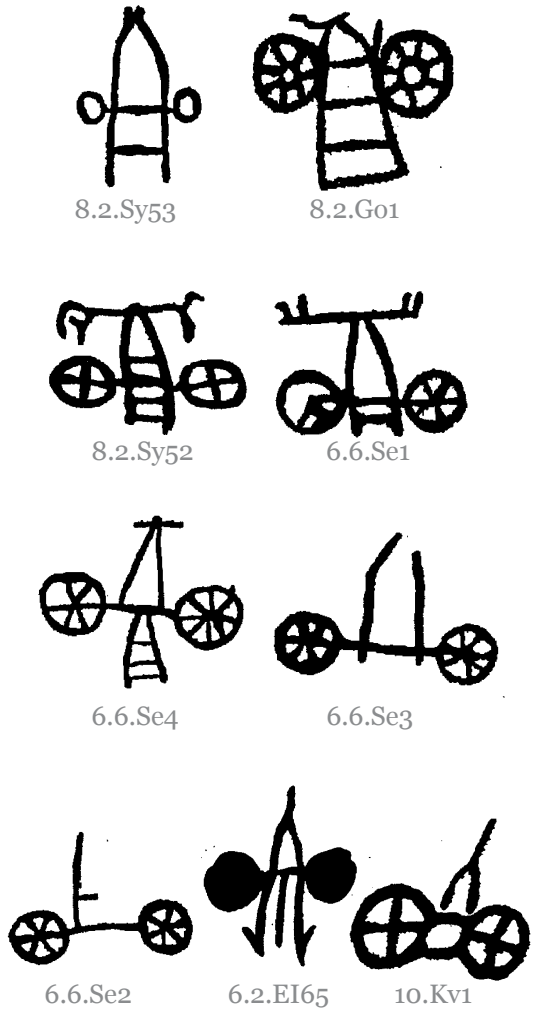


Fig. 48. Chariots of the «A»-shaped form. Subtype 1.

the yoke saddles or leather neck-yokes, or without the yoke (Fig. 49), or only with a crossbar-yoke (Fig. 50). These versions seem to reflect the two ways of fixing the draught-pole to a horse: by putting a special yoke-saddle to a horse neck and to shoulder leather yokes when the draught-pole is kept in parallel to the earth surface. In the latter case, fastening can be fixed beneath a horse's head or on its back. Most often the chariots are depicted with a round platform and four spokes in the wheels.

Widely distributed in Eurasia, found in petroglyphs of Italy, Scandinavia, the Transcaucasia, West Pre-Tyan-Shan, the Jungarian Alatau and the Chu-Ili mountains, Tuva, Altai and Mongolia.

Subtype 3: C2Wsp, lg (d) DPsfAX-BXrnf (df) (DR1st, plDA2bb (ss)). Chariots with a charioteer, no crossbars (Fig. 51, 52:2). A draught-pole could be attached to harness horses with help of leather shoulder yokes and traces. Depictions without (variant 3.1) and with a charioteer (variant 3.2.). These variants are characterized by positioning of horses backs to back of each other, and of the charioteer in plan, standing on the platform (for the second variant). Spread in Altai, China, West and North Pre-Tyan-Shan, the Jungarian Alatau, in Mongolia and the Pamirs.

3.3. A variant: schematic images of chariots with one-two horses in profile, separately from a vehicle (Fig. 51:3), found in the Altai, Tuva, the Minusinsk Basin and West Pre-Tyan-Shan.

3.4. A variant: gig-chariots without the crossbar cross-yoke (Fig. 52:2). Wheels are depicted in different ways, platforms of various forms, draught animals are placed back to back. Represented in India, Mongolia and Altai.

Subtype 4: C2WspDPsfY (yf) AX-BXrnf (df) (DR1st (wl, st) prDA2bb (ll, ss)). Chariots with a draught-pole crossbar and a charioteer (Fig. 52:1, 53, 54). Perhaps, in these images, the ancients emphasized harnessing of draught animals with help of the crossbar-yoke, which was fastened on the nape of horses as well as underneath their heads.

4.1. variant: the chariots with a round platform without charioteers, animals are back to back (Fig. 53:1), found in Altai, Tuva and West Pre-Tyan-Shan.

4.2. variant: the chariots with a charioteer walking or standing nearby, in profile (Fig. 52:1, 53:2), present in Saimaly-Tash,

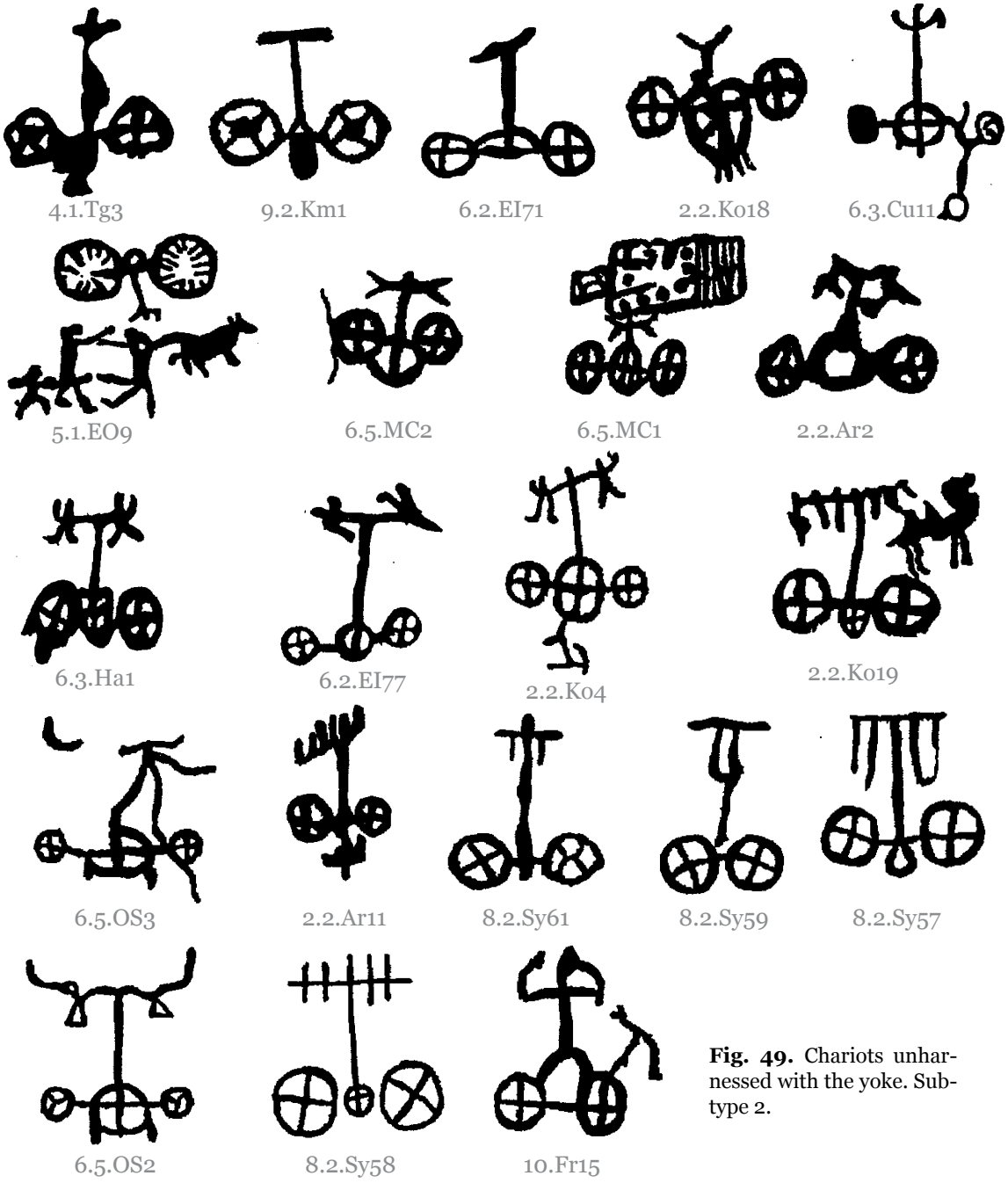


Fig. 49. Chariots unharnessed with the yoke. Subtype 2.

in the valley of the Koksu river (Eshkiolmes) and Karatau.

4.3. variant: chariots with draught animals, legs of which are turned to each other (Fig. 53:3), are present in the West Pre-Tyan-Shan, Jungarian Alatau and the petroglyphs of Scandinavia.

4.4. variant: chariots with a laurel-leave-shaped pommel of the draught-pole and a charioteer (Fig. 53:4), found in the Altai, Mongolia and the Karatau Mountains.

4.5. variant: chariots, draught horses are depicted in profile (one above the other), a draught-pole is fixed under a horse head, and a charioteer is shown sometimes (Fig. 54:5). Images of this variant are known in Tarbagatai, the Inner Tien-Shan, West Pre-Tyan-Shan and the Jungarian Alatau similar to a chariot, carved on a tomb slab in Kivik (Sweden).

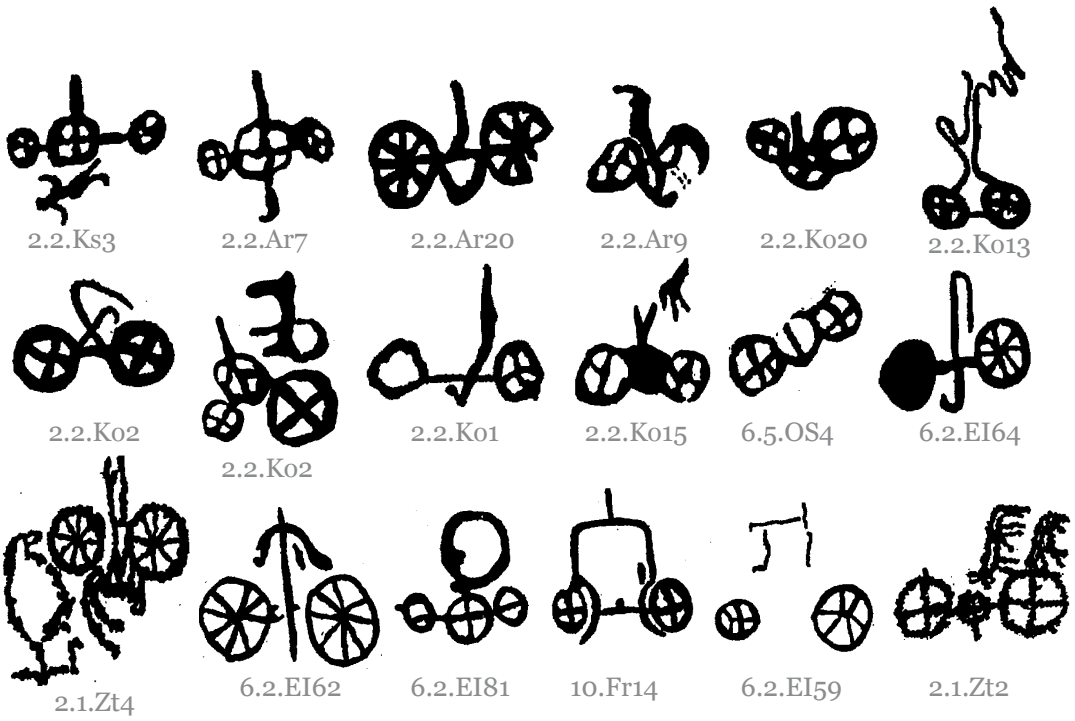


Fig. 50. Unharnessed chariots without yoke. Subtype 2.

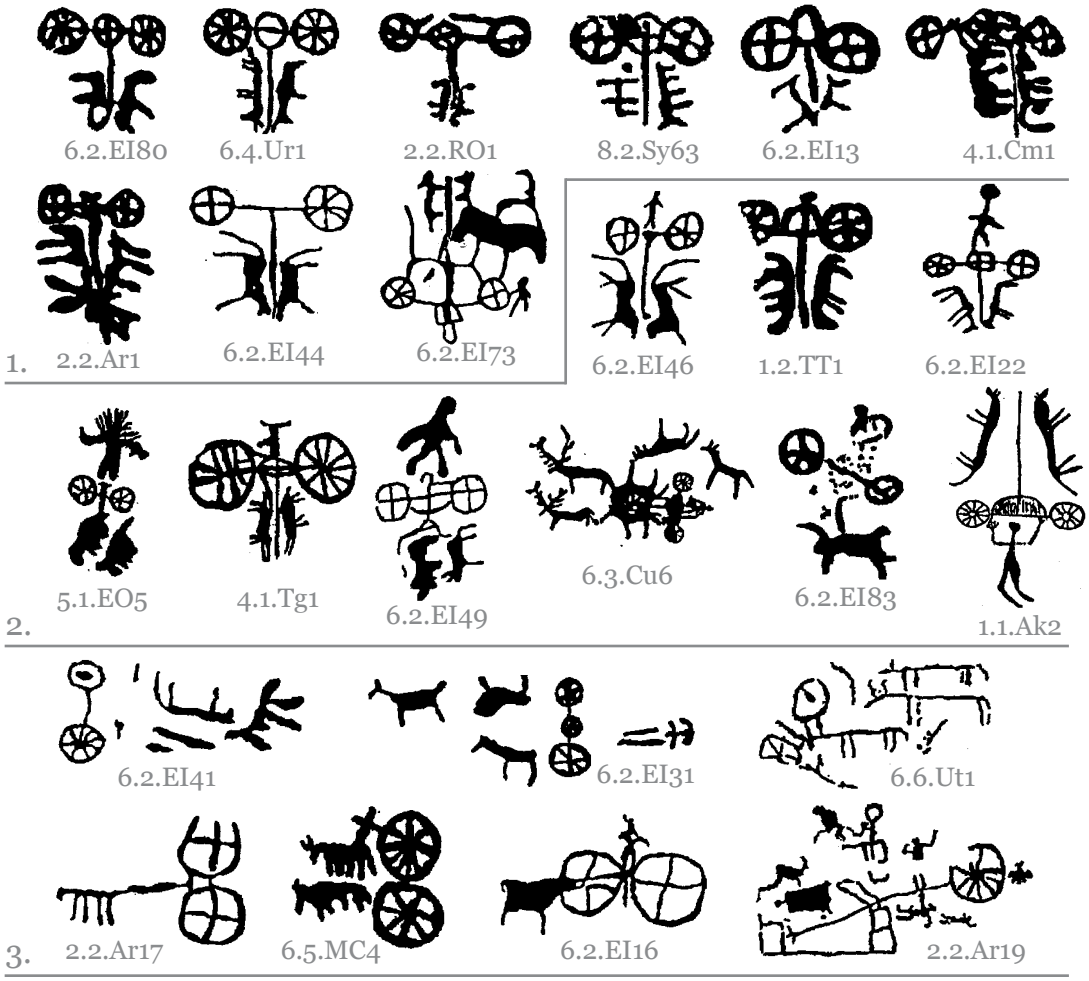


Fig. 51. Chariots. Subtype 3. 1 – version 3.1; 2 – version 3.2; 3 – version 3.3.

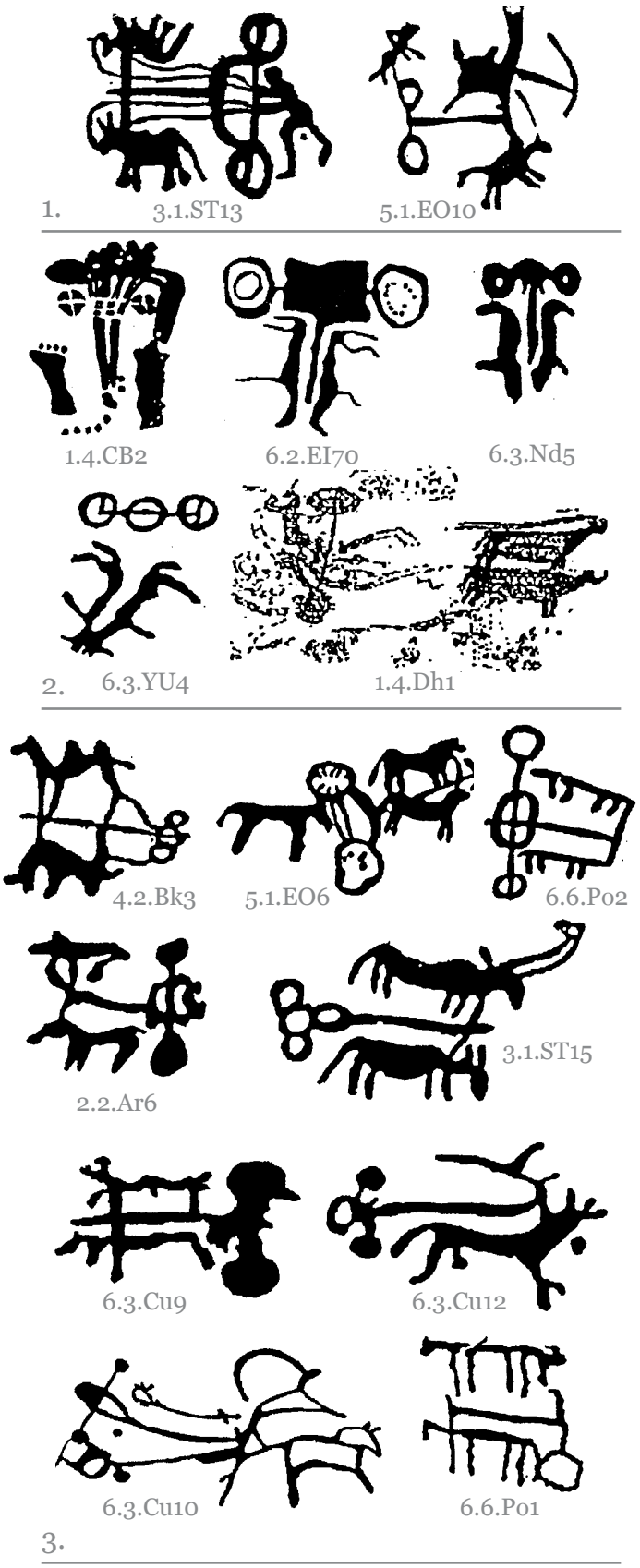


Fig. 52. Chariots. 1 – 4 subtype, a variant of 4.2; 2 – 3 subtype, version 3.4; 3 – 4 subtype, version 4.7.

4.6. variant: chariots of «Y»-shaped bifurcation of the draught-pole (Fig. 54:6). The latter is fixed rigidly to a platform using special braces. Present in Tuva, the Inner Tien-Shan and West Pre-Tyan-Shan.

4.7. variant: gig-chariots with a crossbar cross-yoke (Fig. 52:3), which is fastened to animals in different positions. Characteristic is a position of draught animal images one over the other. Wheels are depicted in different ways. Present in Mongolia, the Minusinsk Basin, the Kazakh low hills, in the Inner Tien-Shan, and the Karatau.

Subtype 5: C2Wsp, lgDPsfYAXBX rnf (df) rs (DR1st, pl, atDA2bb, at, sex).

Chariots with harnessed horses and a charioteer standing on the platform (Fig. 55-60); vehicles are shown with and without reins. Chariots have a very well-developed structure with a wide wheelbase, stable on turns, equipped with a crossbar-yoke, attached most often to horse scruffs. Large diameter of wheels allows to soften road bumps. The platform is round and «D»-shaped, or absent altogether. A charioteer is always portrayed in plan with slightly lowered hands apart, holding a whip or reins. Horses are always placed back to back, rather schematically, with always emphasized ears, rarely with a drop-like point of tail, hooves and the phallus.

5.1. variant: gig-chariots with a charioteer (Fig. 55-56) are considered as a variant of this subtype. The charioteer is standing on a round or «D»-shaped platform. A draught-pole is straight, strengthened on napes of two horses harnessed through the crossbar. Wheels are shown in solid pecking, with spiral or contour lines. The charioteer is depicted in a standard position: in plan with slightly lowered hands apart. Draught animals are always placed back to back. Found in Mongolia and the Altai Mountains. Sometimes reins are shown extending from the animal's head, which may indicate to use of the bridle.

The horse figures are depicted with an exaggerated sex organ, with prominent ears. Recorded in the Elangash river valley, in Altai.

5.2. variant: chariots with the charioteer and reins (Fig. 57). Found in the Altai, India and southern regions of Kazakhstan (Karatau, the Koksu river valley), iconography is similar to «many-draught-pole» chariots.

5.3. variant: with bridle-reins, without the charioteer, present in Scandinavia, Tarbagatai, and Altai (Fig. 58).

Standing out are so-called «many-draught-pole» chariots, with the charioteer in plan and a pair of harnessed oxen or horses (1.4. CN1), or unharnessed chariot in a scene with the charioteer, a dog and a pair of horses (2.2. KO28), or two-horse vehicles, without a charioteer (2.2 KO17). Fixed in Karatau (Koibagar) and India.

Images of this kind can be compared with the findings of the two-draught-poles terracotta models of vehicles in Cyprus, dated to 2 final stage of the Archaic period [Karageorghis, 1977, append. by Littauer & Crouwel, p. 67-73]. Perhaps the origin of the image is associated with the need to strengthen the cross-bar yoke in a strictly perpendicular position in respect to the central shaft, with additional parallel bars and rawhide straps. This way some draught-poles of carts were shown, for example, in Tamgaly and Kurchum. The style of the images is characterized by positioning of harnessed horses back to each other's back in a quite schematic manner, with rare presence of the charioteer, standing on the platform.

D.V. Cheremisin disputed the validity of identifying this type of chariots in connection to images of the Altai Mountains, pointing to the poor quality of rock tracing copies, in which reins are shown as parallel to a central draught-pole and were per-

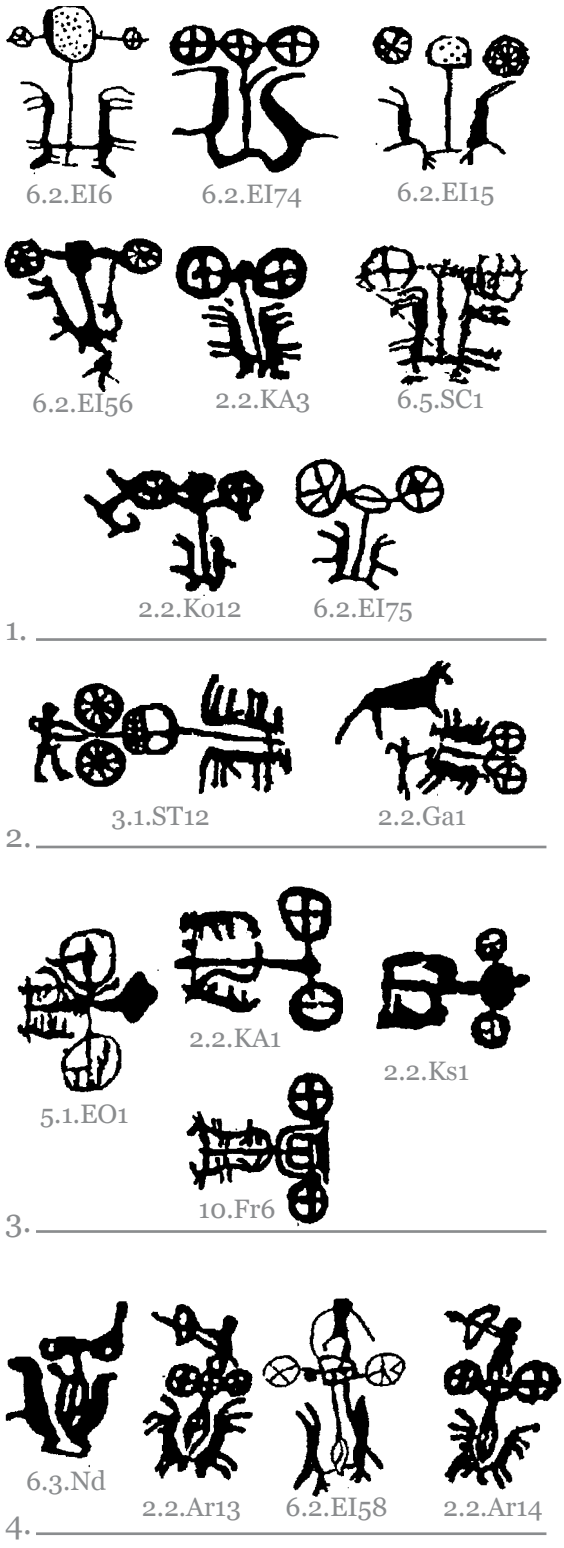


Fig. 53. Chariots. Subtype 4: 1 – 4 subtype, a variant of 4.1; 2 – 4 subtype, version 4.2; 3 – 4 subtype, version 4.3; 4 – 4 subtype, version 4.4.

Fig. 54. Chariots. Subtype 4. Options 4.5 and 4.6.

ceived by other researchers as a triple central draught-pole [Cheremisin, 2005, p. 269]. There are images in my possession of similar chariots painted on rocks in India, and also from other monuments in Kazakhstan, and moreover such innovations in strengthening the central draught-pole were fixed in Cyprus models, are explicitly shown in the Kurchum cart and described in written sources (see the introduction), therefore there is no reason to accept this objection. A significant proof is delivered by the composition 2.2. K028 with an unharnessed vehicle, without harness and, therefore, without reins, with explicitly drawn additional lines, parallel to the draught-pole.

5.4 version: chariots with crossbars and draught-pole braces. Reflect the change in design associated with the need for rigid fixation of a transverse crossbar-yoke and of a draught-pole at a right angle with special braces (Fig. 59). These reinforcing details were absolutely essential in the design of the fastest and most maneuverable chariots at sharp turns and for driving added security. Perhaps, the line running from the draught-pole to the crossbar in the chariot image on the carcass vessel from the Dry Saratovka burial ground is precisely this constructive part. Chariots of this type are present in two sub-variants: unharnessed (5.4.1.) and with draught animals and a charioteer (5.4.2.). This subtype covers the gig-chariot images, made very schematically, like signs-symbols.

Stylistically, all the chariots of the 5th subtype are divided into «realistic» images and «sketchy» ones.

Former ones are characterized by emphasized detailed design of the vehicles: thorough execution of small details, straps of outrunners, yoke-saddles, parts of harness and the platform designs. Animals have marked

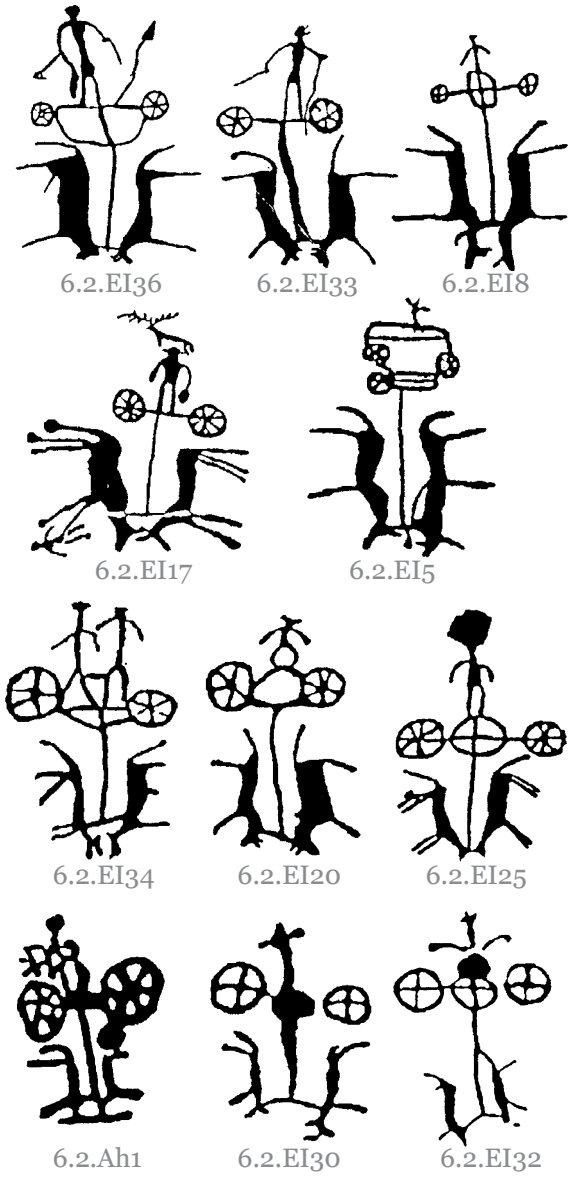


Fig. 55. Chariots. Subtype 5. Version 5.1.

hooves, ears, thickened tips of the tail. The vehicle has a wide wheelbase, big wheels, round or «D»-shaped platform, with the reins. Draught animals are back to back in the biga, triga and quadriga. Localized in Mongolia, Tuva (no charioteer) and in Pamir.

«Schematic» chariots are present in the Altai, West Pre-Tyan-Shane and the Jungarian Alatau. The style of these images is characterized by neglect to small details, schematic outlines and shapes of the charioteer and of draught animals. In same style are gig-chariots with draught animals (Fig. 60):

5.5. variant: with wheels, of solid or contour pecking, draught animals are back to back (majority of images), or «feet to feet» (in two cases). It s a further step in the schematic depiction of a chariot, when the construction details seem to lose their significance, and sign-symbols appear on rocks. Chariots of the variants were found in the Altai, Tarbagatai, in Northern Mongolia, the Minusinsk Basin, similar to some gigs of Northern Europe.

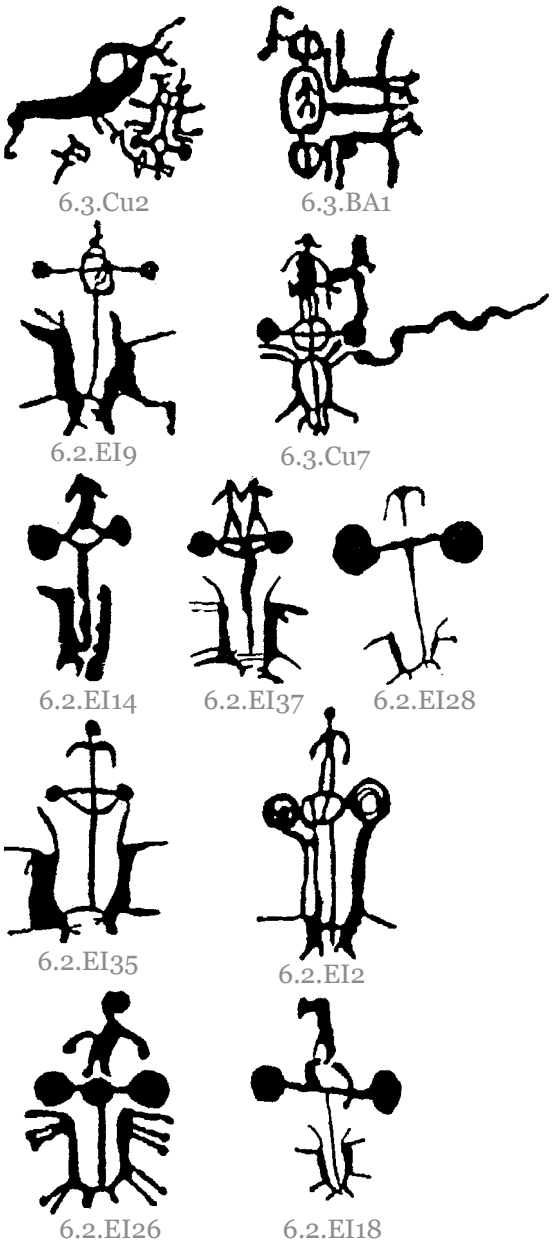


Fig. 56. Chariots – gigs. Subtype 5. Version 5.1.

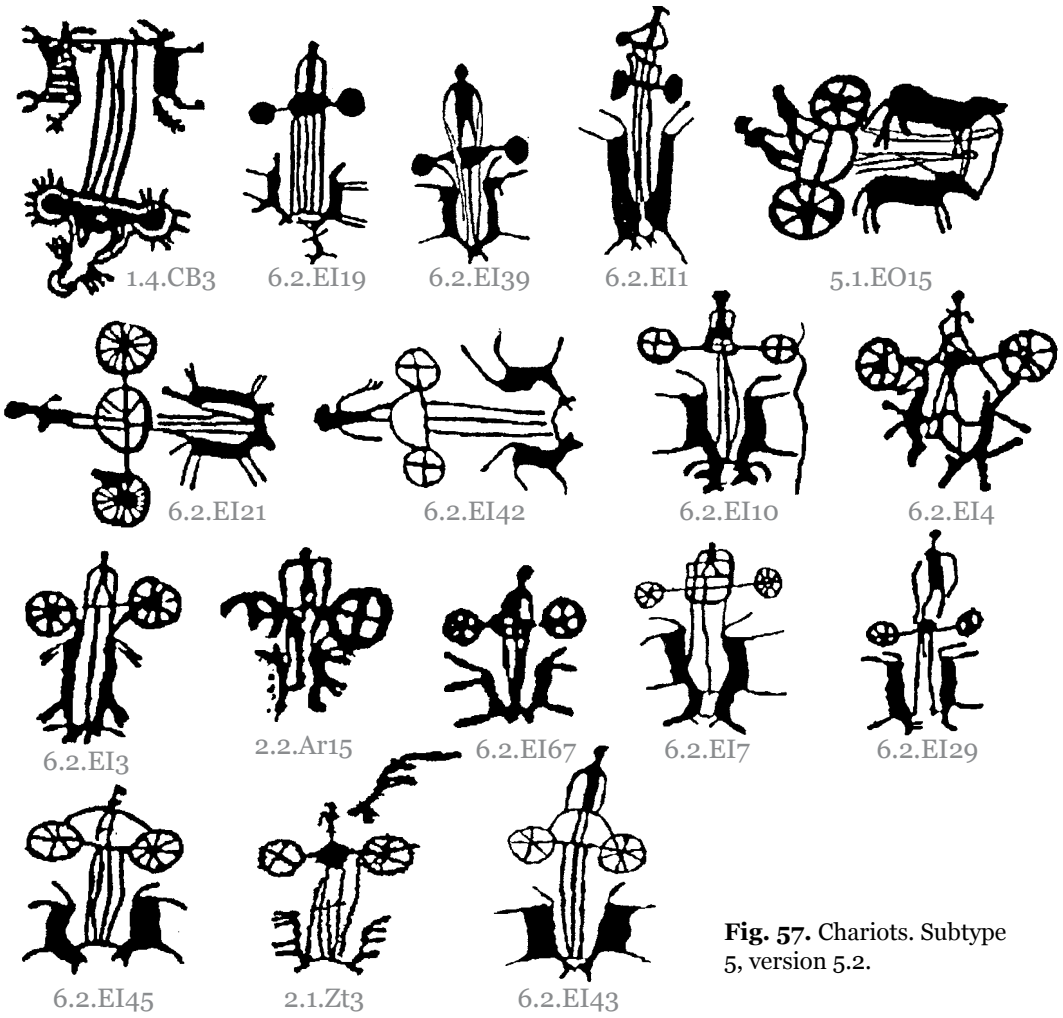


Fig. 57. Chariots. Subtype 5, version 5.2.

Thus, the identified Asian vehicle subtypes and a variety of variants, in the whole, clearly demonstrate (Fig.61) their evolution from a simple to a more complex and diverse structure, fixing some changes in rock expression styles in different regions. Although there are identical subtypes of vehicles present in mutually remote regions, with no evidence of a preceding evolution process. Innovative technical solutions – the «miracles» of the ancient design thinking – appear in a standard form on rocks in the most sacred and innermost cultic centers of the regions.

The cart, a biaxial, solid and a good vehicle on disc wheels, drawn by two oxen, is the most convenient and practical means of transportation in an ancient society. The miracle of its invention gave incredible opportunities in mastering of new areas, developing economic activity, increasing the live-stock and in search of new pastures, which was a vital task for steppe herders. Inventions of a canopy, a tent or a hooded cart, a yourt mounted on a moving four-wheeled platform, is the invention of movable dwellings, which significantly increased the mobility of these societies.

Thus, significant is the emergence of a covered wagon drawn by oxen, with a seated charioteer, discovered on a Znamenskaya stele in the Minusinsk Basin, thousands of miles away from the main center of actual use of the vehicles, recorded by archaeological methods in the Caucasus, the Black Sea coast, the southern Russian steppes. A vehicle from Ust Byur, captured on a rock in the Yenisei river valley, very precisely reproduces an original clay model of a cart (a vessel), found in Budekalash, Hungary.

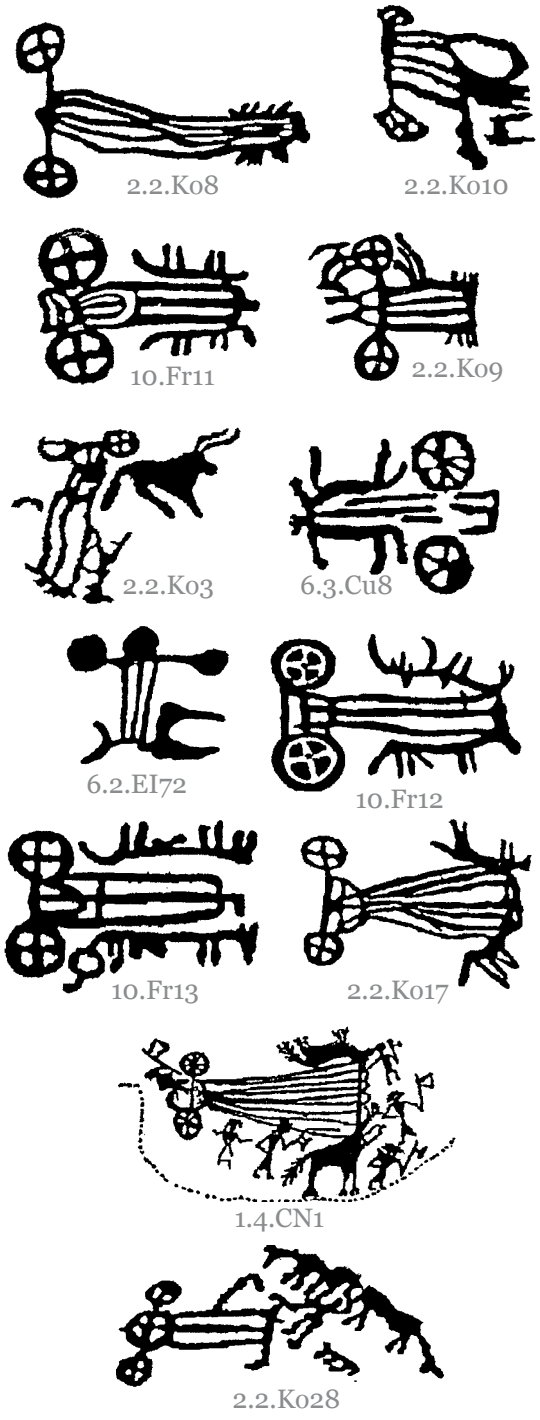


Fig. 58. Chariots. Subtype 5, version 5.3.

Technical innovation associated with attempts to make a big vehicle more spacious, manageable, maneuverable and able to turn about a small radius, and a lighter for draught animals and, accordingly, effective in load lifting, finds expression in the identified four subtypes of vehicles and in appearance of new types of carts: hansom cabs, which are, in fact, represent the front of a cart, a front axle with a pair of wheels.

Articulated carts with «A»-shaped draught-pole on different types of wheels have a wide geography of diffusion and are found in petroglyphs of Scandinavia, the Mediterranean, the Transcaucasia, as well as in Mongolia, Altai and the Minusinsk Basin. Petroglyphs of Transcaucasia demonstrate an evolution of «A»-shaped carts from non-wheeled drag harrows pulled by oxen, to the «A»-shaped gigs on small disk wheels, to chariots with a complex system of harness (yoke-saddles).

«A»-shaped vehicles on disc wheels made of three parts, connected by internal splines, were found in a burial mound 2 of the Lchashen burial ground [Rumyantsev, 1961, p. 236-242; Yesayan, 1966; Mnatsakanyan, 1957, p. 146-153, 1960, p. 139-152]. There are perfectly preserved specimens of this type from archaeological complexes excavated in northern Europe and in steppes of the Black Sea and south Russia. This absolutely recognizable form of vehicles is characterized by the massive draught-pole of two strong beams in the form of a letter «A», to the lower ends of which the wheels were attached, and to the top a crossbar-yoke for harnessing draught animals.

A place above the axle between the wheels served as a platform or a floor for a charioteer or a cargo. Coupled to each other, they became a biaxial cart with a turnable front axle. Separately, depending on the type of wheels and of draught animals, they could become gigs and even chariots.

The evolution of this type of vehicles was facilitated by the need to make vehicles lighter, to compensate an «upset» effect, to improve maneuverability and to adapt new types of draught animals.

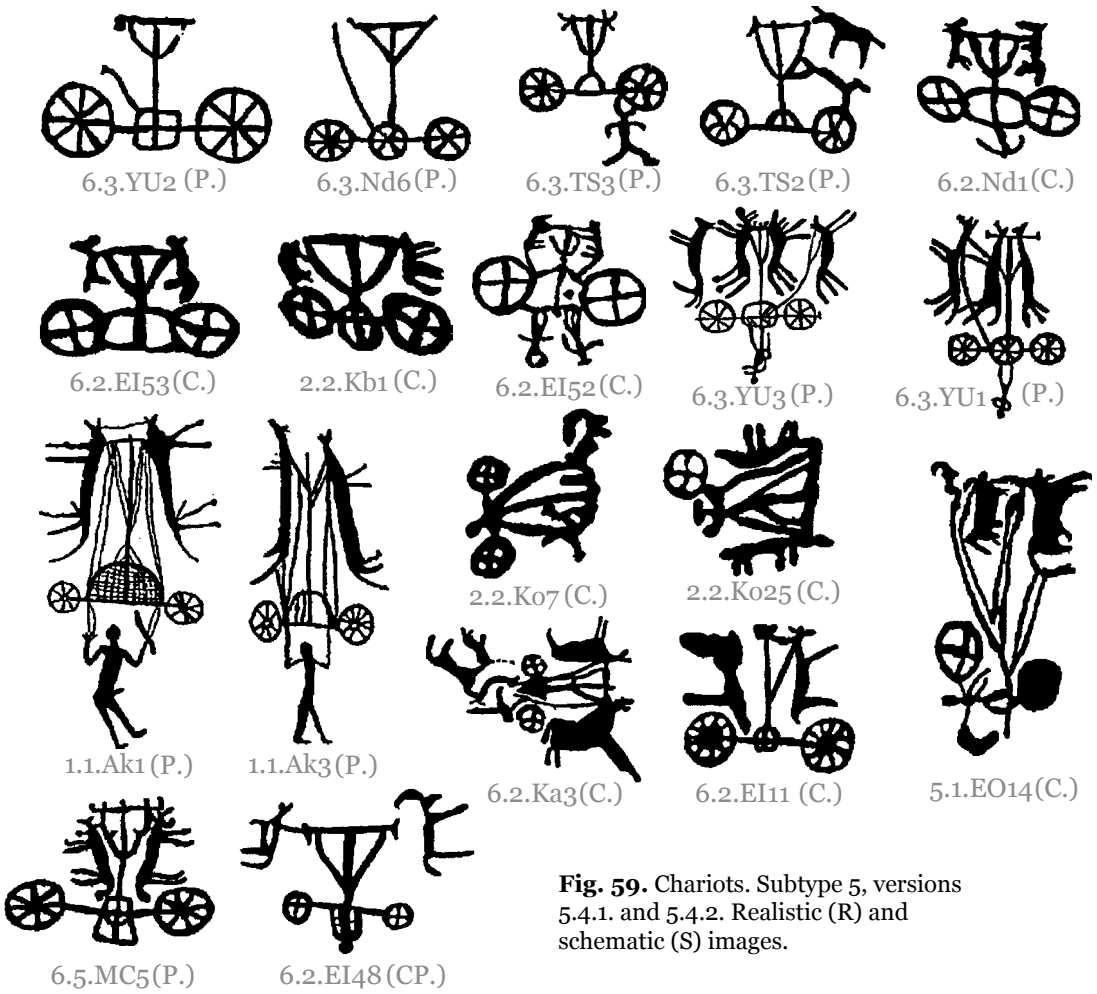


Fig. 59. Chariots. Subtype 5, versions 5.4.1. and 5.4.2. Realistic (R) and schematic (S) images.

Therefore, we see the evolution from the original three-part solid disc wheels, via the lighter cross-bars» with hollows to, finally, spooked wheels. Draught animals followed this trend changing from oxen and camels to horses. Most likely, the evolution of vehicles was directly related to the complex process of domestication of draught animals, their physiological capabilities, and influenced and even dictated their development. It was success in horse domestication in the steppes that led to the emergence of gig vehicles.

Detailed reconstruction of the «A»-shaped two-wheeled vehicles made from the Minusinsk Basin were undertaken and published by Yu.N. Esin in a series of papers [Esin, 2009, p. 68-72, 2011a, p. 267-273].

Indicative in this respect is the first gig subtype, with lightweight disc wheels, fixed on the Askiz stele in the Minusinsk Basin; similar picture is available on rocks of the Elangash river valley in Altai.

The second subtype gigs on small disc wheels have good ethnographical parallels found in Scandinavia and in the Asian monuments of Eshkiolmes, Saimaly-Tash in West Pre-Tyan-Shan, Tuva and Altai.

The fourth subtype images found on rocks of Mongolia, Altai and China are outstanding: covered gigs on big spoked wheels were executed and interpreted on rocks differently. This type of carriages is now well documented upon excavations of the burial complex of the founder of the Qing dynasty, the Qing Shihuang, in China: found were two magnificent carriages, a chariot with an

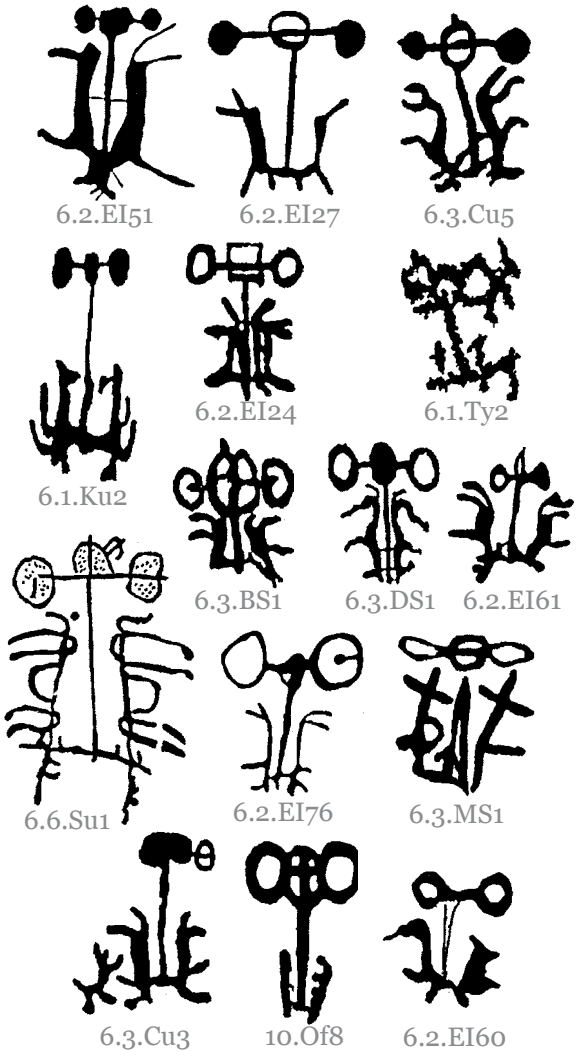


Fig. 60. Chariots. Subtype 5.5. Schematic images.

umbrella over a charioteer and the covered gig of the emperor.

Noteworthy, in ancient China, the vehicles have traditionally developed solely through improvement of the two-wheeled vehicles, based on war chariots of the Shang-Yin period and the West Zhou, improved and modified up to the stout cargo gigs, the covered ceremonial carriages of nobility and the perfectly equipped, sophisticated in design and ammunition, bronze chariots with the umbrella.

However, the most numerous group of images under consideration are chariots of five different subtypes and 16 versions. Their geography is quite wide: already mentioned «A»-shaped chariots of the 1st subtype are known from petroglyphs of the Transcaucasia, the Caspian Sea, Scandinavia, Altai and the Minusinsk Basin.

Only the two unharnessed chariots of the 2nd subtype, the chariot of the 3rd subtype, variant 3.4, reminiscent of sign-symbols, as well as the chariots of the 4th subtype, variants 4.3 and 4.5 are similar in Scandinavia, Italy and the Transcaucasia. Horses in these harnesses are depicted feet to feet and above each other.

Consequently, it would be fair to define the standardized positioning of horses «back to each other's back» as a feature of only Asian chariots, while other variants shall be considered as «western» influence. All other subtypes and variants are analogous to the monuments of the Asian part of the continent, but are more numerous and varied. In addition to their traditional range of distribution in the West Pre-Tyan-Shan, the Jungarian Alatau, the Kazakhstan steppe zone, the Jungarian Alatau, the Inner Tien-Shan, the Chu-Ili mountains, the Talas range, Tarbagatai, in the Altai, Tuva and the Minusinsk Basin, they were fixed in the Pamirs, India and Mongolia as well. (3.1-3, 3.5, 4.4, 4.7; 5.1).

The «realistic» images (subtype 5) were fixed in Pamir and the Mongolian monuments, and the «sketchy» images only in the monuments of the above-listed area. This may reflect, on one hand, the development of a chariot image, its iconography and semantics in a certain geographical area, its communication system, from realistic images to more schematic ones, transformed into a sign of communication and thus able to provide a relative chronology of these images, and, on the another hand, an expansion range and directions of movement of ancient societies.

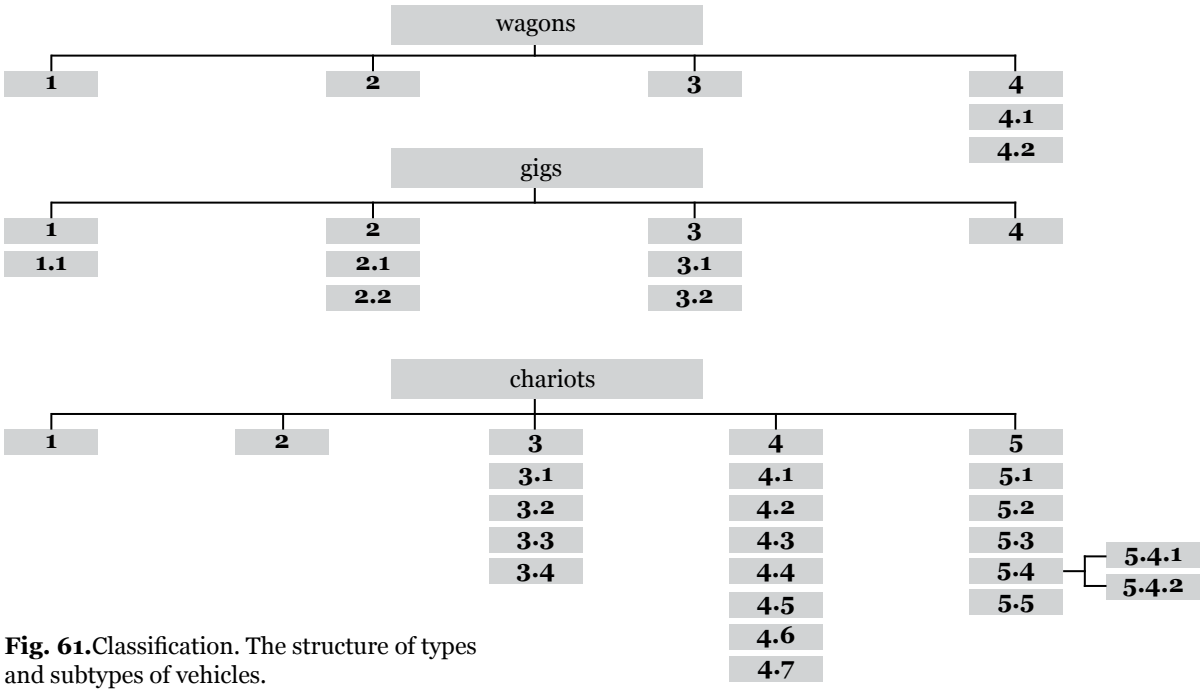


Fig. 61. Classification. The structure of types and subtypes of vehicles.

Such a mass appearance of the image on rocks, apparently, is connected to the explicit success in taming horses and in developing ways of strict control over these animals in harnesses, more advanced skills and innovation in carpentry and bronze casting, and, most importantly, to the growing demand of living here ancient societies, in widening of communication channels, developing new areas and possible expansion.

Pictorial material from the Asian part of Eurasia did not confirm the use of chariots in warfare, and, by contrast, fixed were hunting scenes, where chariots were used as mobile platforms for archers shooting at mountain goats (Arpauzen V, pl., 42), a deer (Chuluut) or for managing the herd of horses (Zhalgyz Tepe) [Pyatkin, Miklashevich, 1990, p. 148, fig. 2-17]. However, it is unclear how these compositions reflect the mythological ideas of their creators and the meaning of the practical use of chariots in these scenes. The use of vehicles in paddocks or battue hunt, often surrounded by figures of dogs, having cultic significance in compositions on rocks, similar to an «imperial hunting», seems to me highly probable. I'd like to support the views expressed by D. Cheremisin [2005, p. 267 – 270], that there is no need in pecking the battle scenes, when the very image of the chariot, imprinted on rocks, reflected a whole range of diverse views and associations connected with it. Because we deal here with a well-developed communication channel, represented by a sanctuary with petroglyphs, the images of the «pictorial series» of the monuments are polysemantic, contain variety of information, which we only can guess. ■

General comments on the iconography and the relative chronology

Iconographic features are directly related to the development of new design features. The original pictorial tradition and style of performance is characterized by a desire to show the very chariot, the charioteer and draught animals in a profile projection.

The next step in the development of the iconography is associated with attempts to portray more accurately the new design features of a vehicle, and as a result, they were pictured in the planned projection, in a more comfortable angle.

Figures of draught animals and charioteers, at first, continue to be portrayed in profile projection, as of secondary importance to the ancient artist. A new visual technique is manifested in images where the charioteer and draught animals are in profile, and the wheels of different sizes: the nearest wheel to the viewer is shown always bigger than the distant one.

Further development of the pictorial tradition was expressed in attempts to understand the laws of perspective, and numerous experiments followed with placement of figures on «stone canvas», inventing new types of designs, primarily of chariots, which resulted in portraying the draught animals and charioteers also in plan.

This pictorial tradition in some period of time, as a standard, spreads over large parts of the steppes of Asia.

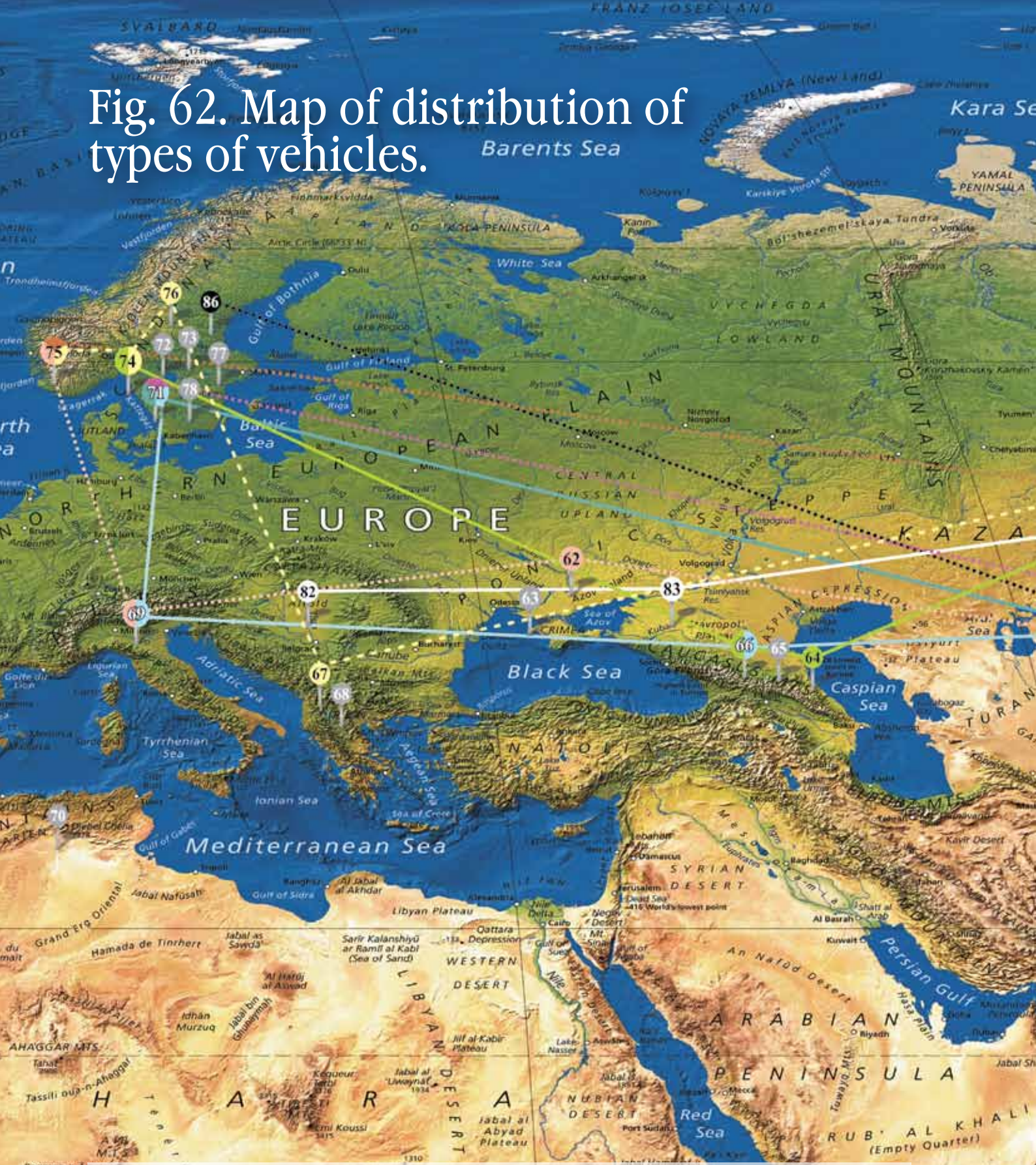
The gradual loss of the practical functions of chariots in lives of ancient societies, the growing role of riders (cavalry), replacement of many functions previously characteristic to the chariotry, led to the development of conventions and a schematics, increase of their mythological significance as a sign-symbol in the communication channels of peoples of those territories.

The process could take three thousand years: from the end of 4th to the last quarter of 1st millennium BC, since invention of the wheel, a revolutionary change, significantly influencing the daily lives of ancient societies, to the campaigns of Cimmerians, Scythians to the Middle East, recorded by Assyrian and New Babylonian offices, and the time when the cavalry has clearly proved its superiority in battle tactics. This enormous period of history is definitely divided into two stages.

The first is the era of inventing the wheel and the first experiments of its application, a first external communications within the Eurasian continent, the development of new territories and dissemination of knowledge about it. At that time, appear the earliest centers of active use of the primitive four-wheel vehicles and their upgrade. This process is directly linked to innovations in the process of domestication and breeding of various kinds of draught animals.

The second period is the era of chariots. The invention of chariots has revolutionarily changed the economic potential of ancient societies and fundamentally changed the process of forming a channel of communication: they began to acquire an expansionist and by far not peaceful character at behest of rulers who have mastered this «secret» weapon.

Fig. 62. Map of distribution of types of vehicles.



1 – Akdzhilga; **2** – Tekke Tash; **3** – Ohna; **4** – Karakiyasay; **5** – Thor; **6** – Chibbarnala; **7** – Dharampuri; **8** – Chatur Bhu Nash; **9** – Eda Kalkave; **10** – Zhaltyrak Tash; **11** – Ters; **12-18** – Koibagar I, II, III; Arpauzen I, II, IV, V, VI, VIII; Koshkar-Ata I, II; Gabaevka; Kokbulak, Xan, Rank-Ozen; **19** – Saimaly Tash; **20** – Tamgaly; **21** – Chumysh; **22** – Dzhambul; **23** – Kesteletas; **24** – Baikonur III; **25** – Sayak; **26** – Eshkiolmes; **27** – Akbaur; **28** – Kurchum; **29** – Moinak; **30** – Tyulkune; **31** – Saur Tarbagatai; **32** – **35** – Kalbak Tash; Zhalgyz Tepe; Elangash; Adyrkhan; **36** – Yamany Us; **37** – Tsagaan Gol; **38** – Bichigtyn-Am; **39** – Hovd Somon; **40** – Beger Somon; **41** – Chuchuut; **42** – Darwi Somon; **43** – Manlay Somon; **44** – Havtsgayt; **45** – Urad (Lanshan); **46** – Jiangsu (Kanguan); **47** – Syyn-Churek; **48** – Mugur Sargol-Chinge; **49** – «The Way of Chinghis Khan»;

50 – Orta Sargol; **51** – Ust-Tuba; **52** – Shaman Stone (Oglahty); **53** – Suhaniha II; **54** – Mountain Tunchuh; **55** – Oshkolskaya Pisanitsa; **56** – Sedlovina Mountain; **57** – Shishka Mountain; **58** – Polosataya (Striped) Mountain; **59** – Mountain Suleek; **60** – Chaan-Shuluun; **61** – Abou Tabang-utskoe; **62** – Kamennaya Mogila; **63** – Tash-Air; **64** – Gubustan; **65** – Gamigaya; **66** – Syunik; **67** – Kavala; **68** – Mycenae; **69** – Val Camonica; **70** – Tassili; **71** – Frennarp; **72** – Bottna; **73** – Svennebi; **74** – Kville; **75** – Ostfold; **76** – Bohuslan; **77** – Simris; **78** – Ostergotland; **79** – Znamenka; **80** – Ust-Byur; **81** – Chernovaya 8; **82** – Hungary; **83** – Black Sea Coast; **84** – Sarmishsai; **85** – Inamgaon; **86** – Kivik; **87** – Chinese Altai.

Fine monuments in the Asian part of Eurasia contain diverse repertoire of petroglyphs forming during thousands of years because of its long-term use, accessibility and convenience. These communication centers were used by many societies who lived in these places.

However, the images of vehicles are dated definitely by contemporary specialists and reliably in regard to other petroglyphs to 3rd – 1st millennia BC. [Sher, 1980, p. 194-232, Devlet, 1980, p. 225-240, 1982, p. 22-47; Novgorodova, 1984, p. 59-90, 1989; Kadyrbaev, Mariashev, 1977, Maximova, Ermolaeva, Mariashev, 1985, Mariashev, Rogozhinskiy, 1991, p. 5-21, etc.], despite the fact that on subjects of vehicles, by stratigraphic observations, two different petroglyph layers are identified: 3rd – 2nd millennia BC and 2nd – 1st millennia BC.

The first is characteristic of compositions with images of vans and carts pulled by oxen, made in profile, the second with horse chariots, as shown in the standard form.

Such wide range of dating corresponds to the proposed observations, but is not satisfactory in terms of detailing the communicative processes. The above-described subtypes of chariots and associated iconographic features permit identification of an early stratum of chariot images in the «realistic» manner and refining the dating of «schematic» of images/symbols within a millennium time period.

On the vast territory, there is a significant stylistic similarities of vehicle images, associated evidently with a single pictorial tradition, the formation of common channels of communication which developed in the Eurasia steppes by ancient societies, professing similar religious and mythological ideas. This situation can be correlated with the period of collapse of a single pan-Indo-European community into Indo-Aryan, Indo-Iranian, and Tocharian branches, and settling of these communities/ tribes all over the territory of the Eurasian continent.

From the perspective of linguistics, this situation corresponds to the final phase of a very lasting process, which begun long before the described events, of separation of a single Indo-European language family into separate groups and the emergence of similar languages among the peoples inhabiting regions very distant from each other. To what extent this assumption corresponds to historical reality, the analysis of archaeological sources will help to clarify. ■

Chapter 2

The earliest centers of wheeled vehicles and formation of a transcontinental communication system (end of 4 – 3rd millennium BC)

In a series of his works, Childe formulated the basic tenets of his theory on Sumer as a center of invention and first use of the wheel as main mechanicals for moving heavy loads. [Childe, 1951, 1954, 1954a]. This concept was based on a number of papers published by the time in Germany and France: [Nuoffer, 1904, Studniczka, 1907, Popplow, 1934, Potratz, 1938, Wiesner, 1939, Noettes, 1931].

The studies appeared in various countries in the 1950s-1960s, considerably elaborated and extended the basic provisions of the concept [Hancar, 1955, Haudricourt, 1948, Yadin, 1963, Hrouda, 1965, Foltiny, 1959, Smolian, 1964, Nagel , 1966, Potratz, 1966, Wiesner, 1968, Klein, 1963, van der Waals, 1964, Piggott, 1968, Gimbutas, 1970; Kammenhuber, 1961 (in Hittite texts), Salonen, 1951, 1956; Zarins, 1976; Kozhin, 1985, p. 169-183, 1990; Gorelick, 1985, p. 183-193; Littauer, Crouwel, 1979].

Some works led to doubts about correctness of certain conclusions by G.Childe [Kuzmina, 1974, 1980, Safronov, 1989; Piggott, 1983]. These materials include ceramic finds of Aztec figurines on wheels from America, very similar to ancient wheeled toys from India.

St.Piggott in his fundamental work on vehicles in Europe drew attention to the radiocarbon dating of the finds, calibrated against the dendrochronological scale, which made more ancient down to beginning of the third millennium BC, and this corresponds to dating of many finds in the Middle East [Piggott, 1983, p. 36-39, 54-64]. V.A. Safronov, formulated a concept of origin of wheeled transport in the Indo-European environment, somewhere in Eastern or Central Europe, regardless of the impact from the Middle Eastern Civilizations [Safronov, 1989, p. 155-179].

A. Hausler in his summary provides a list of findings from the European part of Eurasia and justifies the independent origin of the western finds and of vehicles from the Pre-Caucasus and the Black Sea steppes. Distribution of vehicles in the regions is associated with the ancient Pit's culture (culture of painted skeletons) [Hausler, 1981, s. 581-647].

New materials and research papers are represented by those published in specialized collections on contemporary issues in studying ancient wheeled vehicles [Fansa, 2004, s. 9-13; Burmeister, 2004, s. 13-40; Crouwel, 2004, s. 69-86, and others]. ■

The ancient Near East

The cultural and historical situation of the region, limited in the west by Mesopotamia, in the east by the Indus basin, in the north by the Central Asian states, and in the south by the north-east coast of the Arabian peninsula, is represented as «a well-defined continuum of repetitive structures» [Lamberg-Karlovsky , 1990, p. 3-21].

The literature on wheeled vehicles contains two explanations for their origin: the 4-wheeled vehicle appeared from sleighs, the 2-wheeled vehicle from the scraper. The need to improve the process of moving goods is an impelling reason for the evolution. Placing round logs under a platform with cargo is first step to a wheeled vehicle. Next step is to fix those two logs under the platform. This development seems to be more natural than the desire to underlay logs under the lower ends of a scraper. A two-wheeled vehicle was developed as a lightweight version of a heavy two-axle cart [Littauer, Crouwel, 1979, p. 8-12].

The oldest evidence of using rollers in combination with sleighs is present in pictograms of Uruk. And only in the first half of the 2nd millennium BC appeared «A»-shaped vehicles from the Transcaucasia, which can be correlated with the scraper [Piggott, 1968a, p.289, Littauer, 1977, p. 260] (Fig. 3:1-2).

The fact that various experiments were held in ancient Sumer whose purpose was to use animal draught power, is reflected in a cylinder seal from Southern Mesopotamia, dated to the mid-4th millennium BC (Fig. 63:1-2). As a result of many years of research, vehicles of the ancient Near East became better studied [Littauer, Crouwel, 1979, in the light of criticism of this book: Jacobs, 1984/85, s. 153-158].

Typology of ancient wheeled vehicles depends on types of draught animals, and is based on the evolution of main structural elements: the wheel, draught power transmission system, a body [Littauer, Crouwel, 1979; Piggott, 1983].

The earliest wheels were of one piece, small size, since they were made of cross cut logs. Later came composite disc wheels, assembled from two or three boards joined together with special fasteners or splines. The next stage is connected with attempts to lighten the heavy wheel disc by use of grooves and cross-bars. The evolutionary row in ended by invention of the wheel with spokes, which also kept improving over time through the use of different rims and tires made of metal or rawhide.

In ancient times, the draught-pole harnessing was a method wide in use, which offered few options. Shafts combined with the collar were fixed in Han China (3 BC) [Littauer, Crouwel, 1979, p. 8-9; Noetts, 1931, p. 83-109; Needham, 1965, p. 247; Piggott 1968a, p. 267]. Recently, new data appeared evidencing its earlier invention in Central Asia [Kircho, 2009; Sariandi, 2010. See: Appendix 3.].

Yokes for attaching the draught-poles to animals have also changed: from the massif crossbars yokes used in bull harnesses to the yoke-saddles with neck straps for each animal and appearance of the shoulder yokes. [Spruytte, 1983, p. 9-20].

If the progress in constructing the heavy four-wheeled carriages was reduced mainly to the invention of the front rotary axis and the use of lighter wheels with different

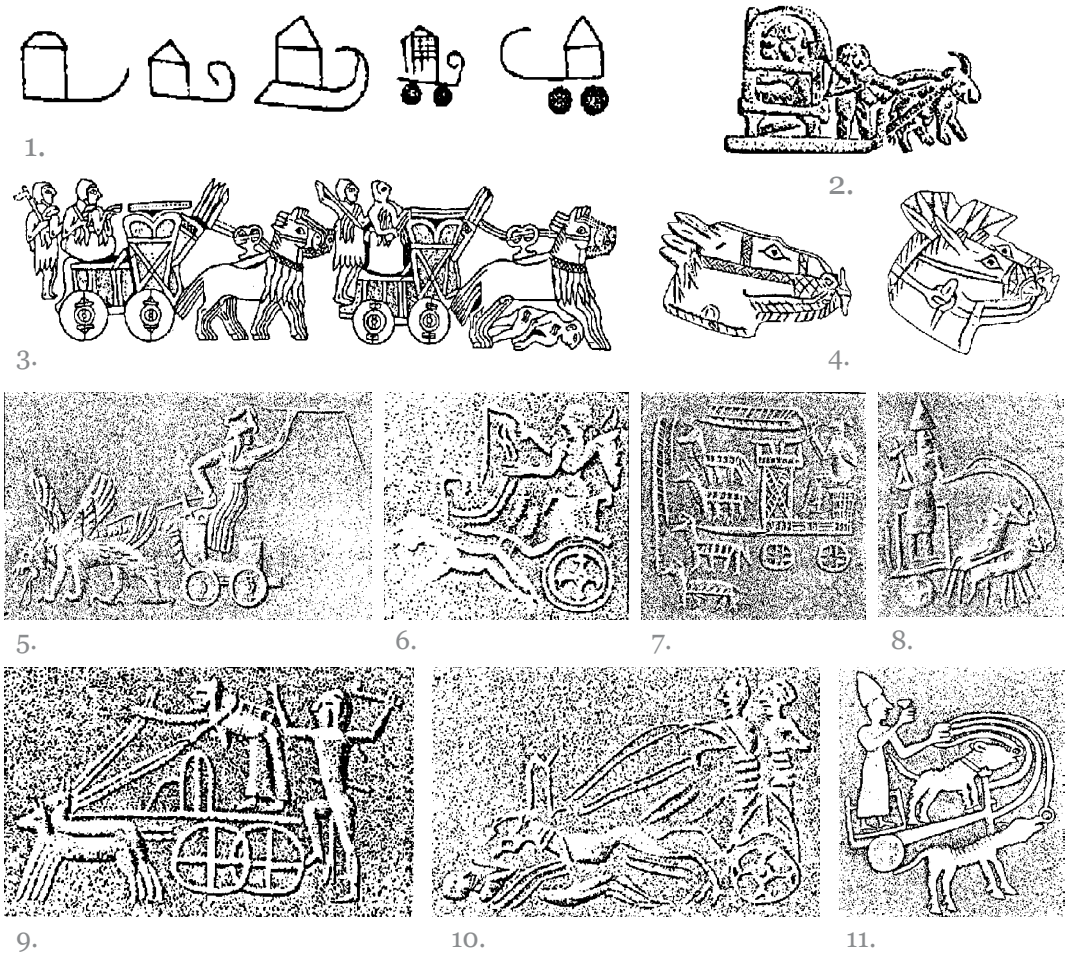


Fig. 63. Near East. 1 – Uruk IVa, pictograms on clay tablets; 2 – stone tiles, London, British Museum, N 128 858; 3 – detail «of the Standard of Ur,» London, British Museum, N 121 201; 4 – Mary, detail of mural in Paris, the Louvre; 5 – detail of a cylinder seal, New York, Metropolitan Museum of Art, a collection of 230 N. Morgan; 6 – detail of a cylinder seal, Oxford, Museum Ashmolian N1920.25; 7 – detail of a cylinder seal impression, Paris, Louvre Museum, the collection of Clair, N 284; 8 – detail of a print cylinder seal, New York, Metropolitan Museum of Art, N66.245.17; 9 – detail of a cylinder seal, Paris, National Library, N 480; 10 – detail of a cylinder seal, Yale Babylonian Collection Neville, N 343; 11 – Karume II, Kultepe, detail of a print cylinder seal. [Littauer, Crouwel, 1979, p. 8-21]

forms of the body, the single-axis vehicles developed into light maneuverable carriages, battle chariots, representing an aggregate of the latest achievements of ancient civilizations. The system for controlling animals improved too: there are new types of psalii and bits; new technologies for the manufacture of durable and reliable vehicle parts also developed.

Priority use of ancient wheeled carriages over the horse riding has importance in studying their history. As noted by M. Littauer and J. Crouwel, in the Middle East riding came at the same time or somewhat later than invention of wheeled vehicles. But the use of riders, as a regular military force, was long hampered by the herd instinct of horses, which could not be used

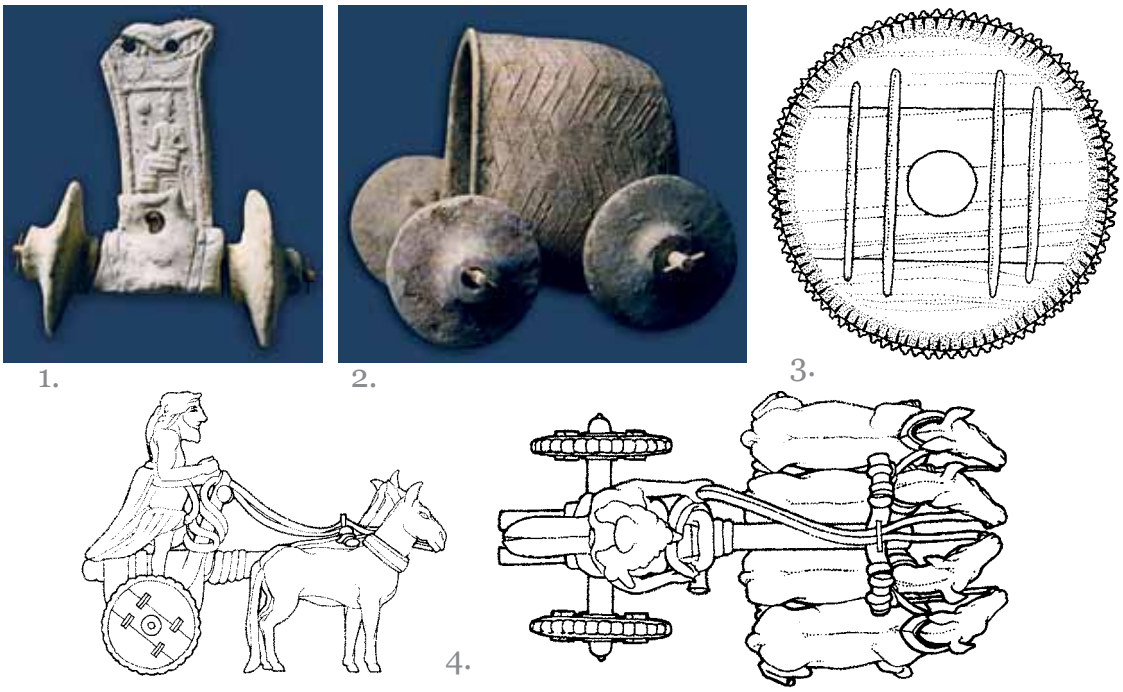


Fig. 64. Near East. 1 – terracotta model of a cart with a seated deity (foto Musee du Louvre); 2 – terracotta model of the van, Syria (foto Allard Pierson Museum, Amsterdam); 3 – Wheel of Susa; 4 – Model, Tel Agrab [Littauer, Crouwel, 1979 b fig. 5.7].

singly. In addition, the horse was not yet provided with a horseshoe, and their claws erased much quicker than that of donkeys and other equines.

Equines were used in caravans to transport load packs and under the saddle, located on the rump of animal (donkey's saddle) [Littauer, Crouwell, 1979, p. 10-13]. Clay tablets with images of covered vehicles on 4 wheels or with rollers, dated by the radiocarbon method to 3200-3100 BC, were discovered in the southern part of Mesopotamia, in the Uruk IVa layer. One of the vehicles were shown with a sitting man; bulls as draught animals; the central draught-pole as a draught system. Animals were controlled by the rope, end of which was tied to the nose ring (later equines were also steered so).

Sumer: vehicles found at Kish, burial «Y», the graves 237, 357, 529, and at Ur, in the royal cemetery, the graves 580, 789, 800. The researchers noted the high skill level of vehicle manufacturers, which implies the existence of sustainable technologies of processing wood, metal and certain craft skills. Reconstruction of a vehicle with curved rods above the platform and the high detachable front suggests an installation of a van in the grave [Woolley, 1934; Kozhin, 1982, p. 48-52].

Elam: graves vehicles no. 280, 322 in the Donjon cemetery at Susa contained, apart from the remains of vehicles, fragments of pottery depicting a covered cart drawn by a bull.

The remains of Sumerian and Elamite vehicles in combination with synchronous pictorial materials allowed identifying the earliest types of vehicles that were used here in the first quarter of the 3rd millennium BC. I'd like to note the genetic link between pictures on clay tablets from Uruk IVa: a covered scraper, a mobile homes on

rollers, and vans represented in these burials. The latter should be viewed as a covered version of a «battle» cart, which has found its continuation in the large number of series of toy clay models.

The most of the Elamite graves with vehicles were dated to the Early Dynastic period (ED IIIa), which corresponds by the «average» chronology to 2723-2600 BC, by the «short» chronology to 2500-2400 BC. The graves at Kish, as well as models of vans and gigs from Tel Hueyra and Alaja Hüyük in Anatolia, dated to the period of ED II [Littauer, Crouwel, 1979, p. 16], which makes even more older the identified types of vehicles.

Southern Turkmenistan, Iran: in layers of the end of 4th – beginning of the 3rd millennium BC, of Aeneolith and Bronze ancient agricultural settlements of Altyn-depe in southeastern Turkmenistan, occurred clay (with wooden axles) and the terracotta models of one-axial two-wheeled vehicles with the central draught-pole, drawn by a pair of oxen. In the second half of the 3rd millennium BC, four-wheeled models with high sides and two shafts in a camel harness appeared occasionally [Kircho, 2009, p. 25-33]. In Gonur-Tepe, similar carts with brass tyres and shafts were found in the tombs [Sarianidi, 2010, see Appendix 3]

Thus, draught transmission with use of shafts appeared here very early. Perhaps further study of the artifacts will refine the proposed dates. Models of the Altin-Tepe vehicles show different forms of bodies and their boards, designs of covers and the rigid fixing method for the axis to rotate the solid disk-shaped wheels.

In the Middle East the earlier examples of models with double-sided naves are dated to the beginning of 4th millennium BC, come from the early agricultural settlements Sialk in Iran. There are models of

Fig. 65. Anatolia. A bronze model from Alacahuyuk [Burmeister, 2004, s. 18, abb. 4].

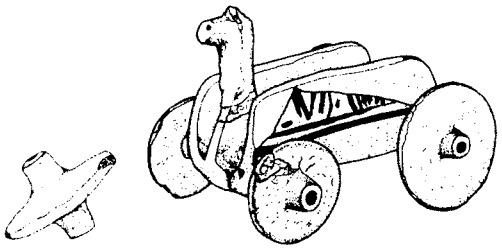


Fig. 66. Turan. Anau Tepe. The model with protoms of camel and the wheel model [Kenoyer, 2004, s. 93, abb.5].

wheels from Shah Tepe and Namazga III and a vehicle model with a protomai of a draught animal, a camel (Anau III, Fig. 66), as well as prints of cylinder seals [Kuzmina, 1980, p. 11-35]. The monuments were dated to the period I ED [Safronov, 1989, p. 164].

Harappa Civilization: mainly models of two-wheeled vehicles (Fig. 67-68) with a peculiar, oval «in profile» body platform and with rods, forming the basis for the overlapped cover were found. Wheeled vehicles of the Harappa civilization have quite a peculiar structure, which differs from the synchronous Near East vehicles [Sher 1980, p. 215].

In Harappa, no evolution of a transport means was observed. No burials were found here with remnants of actual vehicles in graves. Innovations in design were reduced to the early invention of the shafts method harnessing (of Turan), which led to the replacement of two draught animals by one

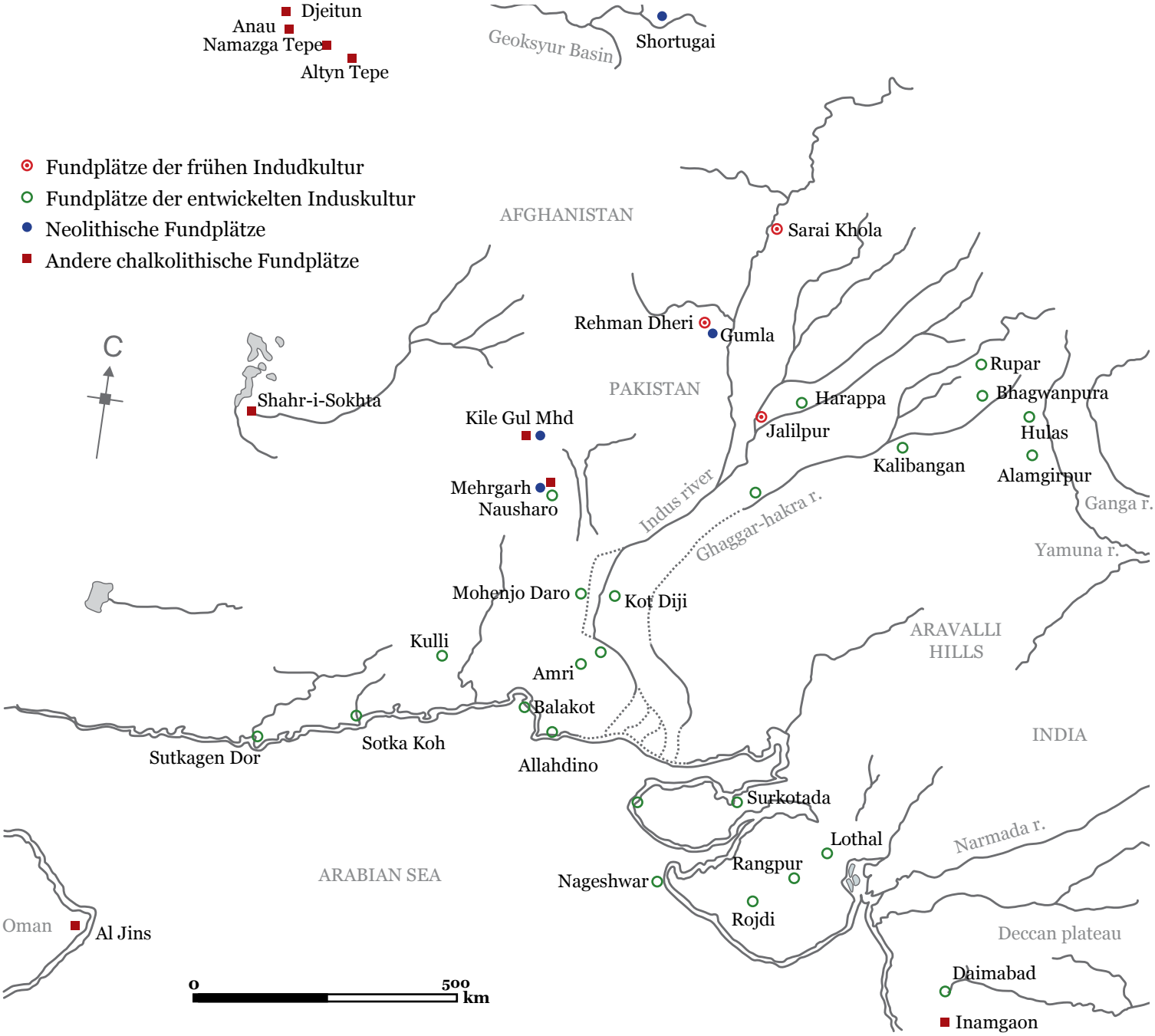


Fig. 67. Harappa and Turan. Map of monuments [Kenoyer, 2004, s. 88, abb. 1].

and the replacement of heavy disc wheels by the lighter spoked wheeels. In Turan, bulls were replaced by camels in harnesses very early, while in Harappa vehicles were developed of nearly one design: the two large wheels with spokes (arba) of universal freight and passenger use, drawn by a pair of oxen, which survived until the ethnographical modernity in its initial form (Fig. 69).

In the early 3rd millennium BC, the Near Eastern type of four-wheeled carriages are represented by battle carts with high limber vehicles, handrails and low side walls, with a narrow body, sufficient for the charioteer and a passenger (Fig. 63: 3, 5, 7). Now for the first time gigs of two types appeared: «sitting vehicles» with a massive draught-pole, on which sat a charioteer (Fig. 64: 4), and vehicles with an open platform, representing a two-wheeled version of the battle cart (Fig. 63: 6, 8, 11).

The peculiarity of the carriage is a special seat for charioteers. All types of vehicles had three-part disc wheels which rotated on fixed axes. Draught-pole is curved or

straight. For the first time as the draught animals used equine, asian «half-asses» (Equus hemionus) and donkeys (Equus asinus), very rarely the horse (Equus caballus). Team usually consisted of 4 animals: two draught and two outrunners (Fig. 64:4).

Battle biaxial vehicles were used as mobile platforms from which darts and spears were thrown under cover of a high front end. These vehicles could turn only in a large arc, until the moment when their front axles became flexible in the horizontal plane too. Use of gigs in the military affairs was not recorded. They could be used as vehicles for communications and hunting.

By the end of the 3rd millennium BC, all types of vehicles were improved. A metal rim appeared on the wheels. A wheel with crossbars appeared. Draught-poles were predominantly of arch type. Documented is the use of all types of vehicles in cultic ceremonies [Littauer, Crouwel, 1979]. ■

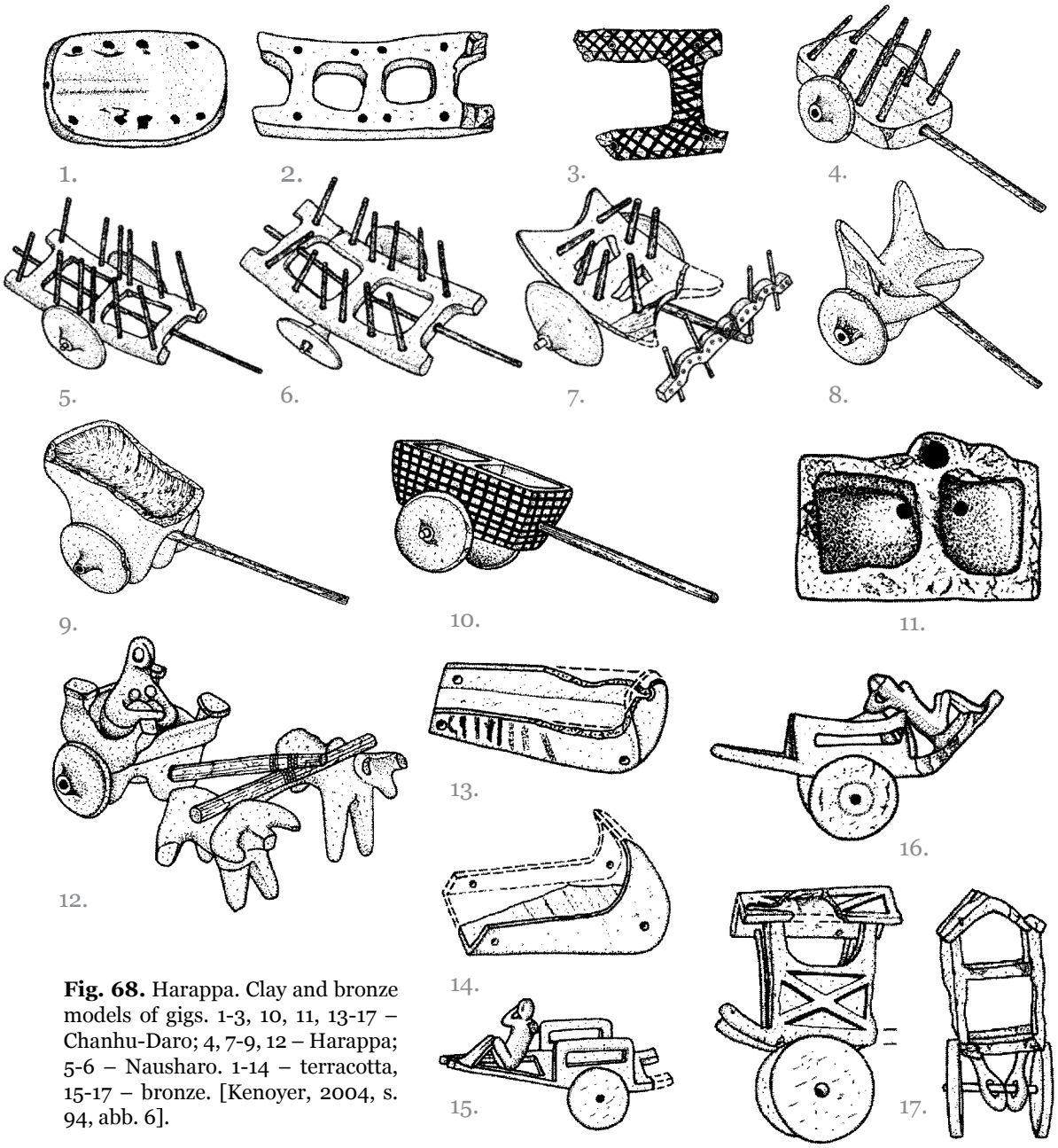


Fig. 68. Harappa. Clay and bronze models of gigs. 1-3, 10, 11, 13-17 – Chanhu-Daro; 4, 7-9, 12 – Harappa; 5-6 – Nausharo. 1-14 – terracotta, 15-17 – bronze. [Kenoyer, 2004, s. 94, abb. 6].

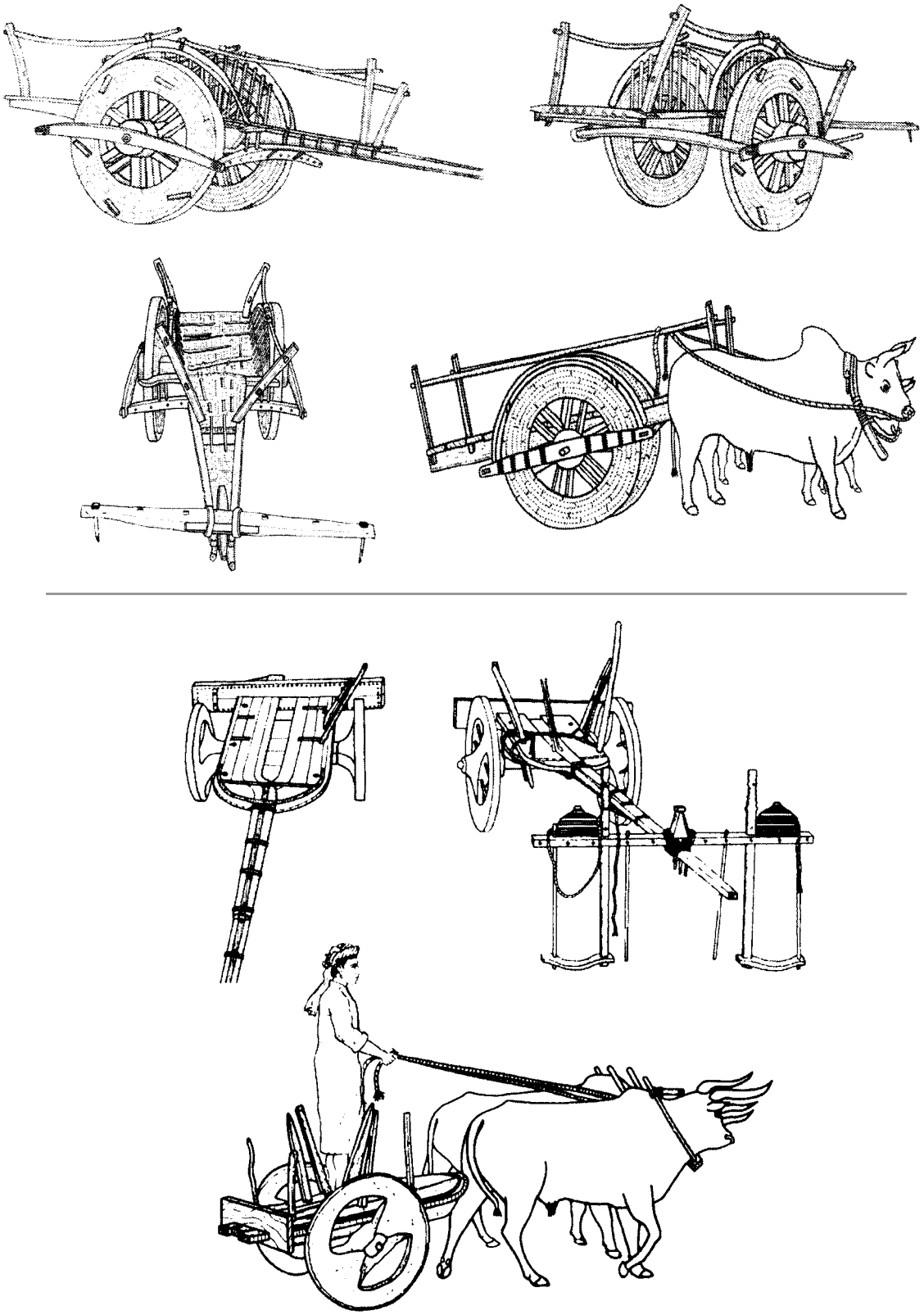


Fig. 69. Gigs from Pakistan and India [Kenoyer, 2004, s.100, 102, abb. 10, 14].

Transcaucasia

The population of this vast region was developing the areas of the Black Sea, the Caspian, the Azov area, being in constant contact with the agricultural civilizations of Mesopotamia and Asia Minor, the fact, confirmed by the analysis of traditional cultic objects of the archaeological cultures known here [Japaridze, 1981, p.31-34].

Assumed is also a direct migration from the Near East and northern Mesopotamia of some groups of population which is fixed in archaeological data by the antiquities of Maikop, and possibly, of the Kura-Araxes cultures [Safronov, 1989, p. 155-179].

Models of vehicles in the Kura-Araxes cultures were found in the north-east of Armenia, on the Harich settlement [Khachatryan, 1975] and were dated to the second half of the 3rd millennium BC. The pottery of this culture with the red inner surface and kanellurs is similar to that found in Syria and Palestine (Khirbet Kerak, etc.). Burials were made in the pits and stone box tombs in crouched position, on one side. To the final phase of this culture relate the graves with vehicles in the Bedeni mounds [Gobejishvili, 1980]. Found were remains of a four-wheeled vehicles in the mound 10. Decorated wooden piece of the body with a carved geometric designs was preserved [Kozhin, 1982, p. 53]. This finding allows us to define the vehicle as a van, similar to those found in more recent times in the Trialeti mounds, and very similar to that found in Kish. The Beden graves with vehicles are dated to the second half of the 3rd millennium BC.

The remains of a van were revealed in Transcaucasia, in the cemetery Pavlograd, Mound 4, Grave 18 [Safronov, 1989, p.175-176, Fig. 49-4,6]. Based on the published plan, the remains of the deceased were inside the vehicle. A ceramic set of 10 pots and a tomb itself were attributed to the Maikop culture antiquities that date back to the end of the 4th- beginning of 3rd millennium BC [Andreyev, 1977.1979] or 24th – 23rd centuries BC [Safronov, 1989, p. 176].

In the Trialeti burial ground, found were remains of four-wheeled vehicles: the mounds XXIX, XVIII, XLVI [Kuftin, 1941]. Then work on the monument continued, and in the 5th barrow another carriage was found [Japaridze, 1969]. Vehicle's body parts from a barrow XXIX were not preserved. Vehicle's body dimensions from mound 5th 1.7 x 1 m [Piggott, 1983, p. 68].

There is a special dais-seat 25 cm high for the charioteer in front of the platform, the body's longitudinal bars has 12 holes for fixing the overlapping stands. The fact that the van was installed in the grave is confirmed by the mound's plan and the cross-section (Fig. 70). No remains of a draught-pole or yoke were found. The front axle was not to be turned over in the horizontal plane. It would need, according to the reconstructions, 20-30 m.

On one of the cups found in Trialeti, a scene with anthropomorphic creatures in masks and «tails» was captured [Kuftin, 1941. a. 75]. A set of jewelry and ritual objects from the tombs by many analogies in the ancient Near East were dated to the turn of 3rd and 2nd millennia BC [Burney, Lang, 1971, p. 95; Maxwell-Hyslop, 1971, p. 74-76]. The date was calibrated with the radiocarbon method: 1730 BC [Burchuladze at al., 1976, p. 355-361; Piggott, 1983, p. 70].

Similar types of carts, apparently synchronous in time, were found in other tombs on the Trialet plateau. In the Zurtakety burial, the mound 5, a van was installed in the grave box in front of which there was a yoke. Naves of the vehicle made of oak were much worn out due to long-term use

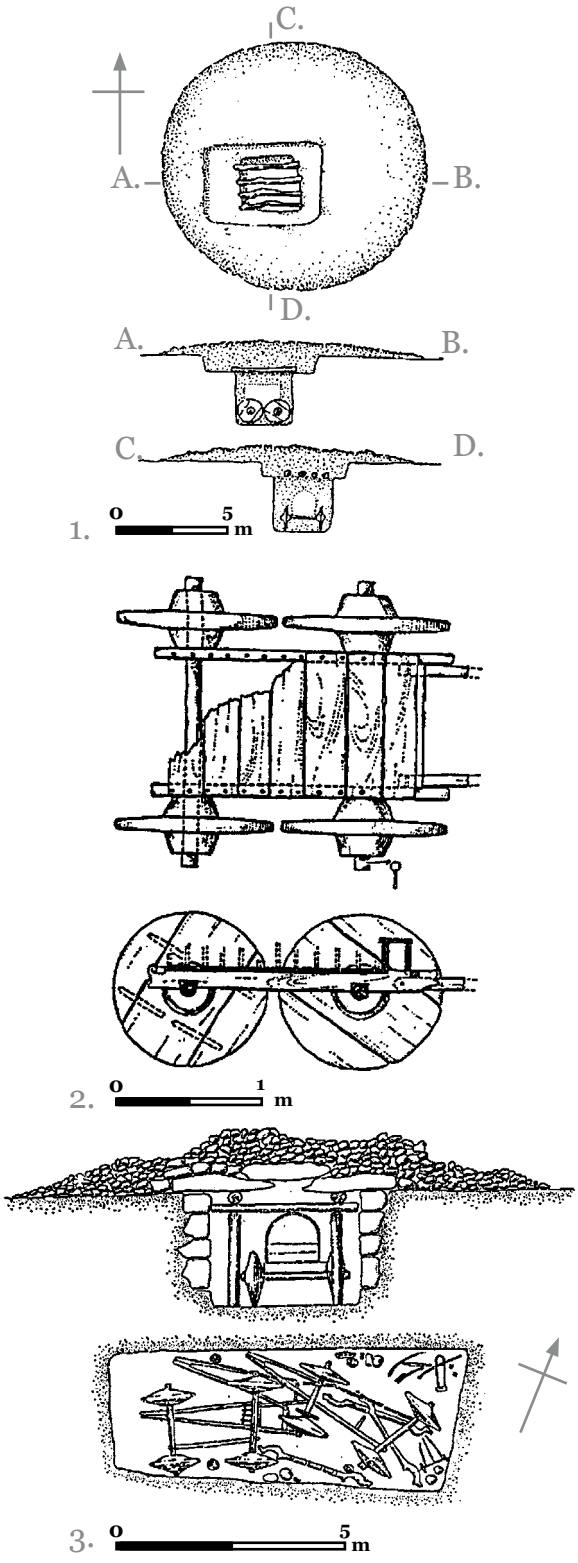


Fig. 70. Caucusus. The graves with wagons. 1 – Trialeti (Georgia), Barrow 5, plan and sections; 2 – vehicle from the barrow 5, Trialeti; 3 – Lchashen (Armenia), barrow 2, plan and sections of the burial pit with the carts. [Piggott, 1983, fig. 28, 31-32].

[Kozhin, 1982, p.52]. The remains of vehicles were found also in mounds of Utamysh [Kotovich et al, 1980, p. 46-47].

Findings in the Transcaucasia and adjacent foothill and steppe regions are represented by models of vehicles and remains of vans, covered vehicles, from the 3rd millennium BC. A tradition of decorating the van walls was recorded, which is explicitly present in the findings of the subsequent periods.

Vehicles of Lchashen mounds were described repeatedly [Mnatsakanyan, 1957, p. 146-153, 1961. 139-152; Rumyantsev, 1961, p. 236-242; Yesayan, 1966; Kozhin, 1982; Piggott, 1983; Hancar, 1955, s. 173; Burney, Lang, 1971, p. 104-107]. Barrows are stone mounds, under which there is a large burial cyst pit, lined with stone blocks and roofed on top by large slabs. Sometimes one grave contained several vehicles. Thus, the barrow 2 kept: a van, two gigs, and a model of vehicles (Fig. 71). There were, apart from the vehicles, collective burial of up to 30 individuals, bones of large cattle and horses, ceramics, bronze items and ornaments.

The remains of the vans were laid in the graves as follows: mound 1 – details of the overlapping survived. «A»-shaped draught-pole and a yoke were on the bottom of the grave separate from the vehicles. Nearby were two skulls, of oxen and of a human; mounds 2-3 contained parts of the van, «A»-shaped draught-pole; mounds 9-10 contained two well-preserved vans, the overlap of one of them consisting of arched rods, fastened in the side bars holes of the frame. This van's top was covered with felt or mat. The front wall of the van from the mound 9 is decorated with carved spiral ornamentation (Fig. 71:4), an open high cart with latticed side boards and rear panel, round on top and ornamented with carved geometric patterns was found in the mound 11.

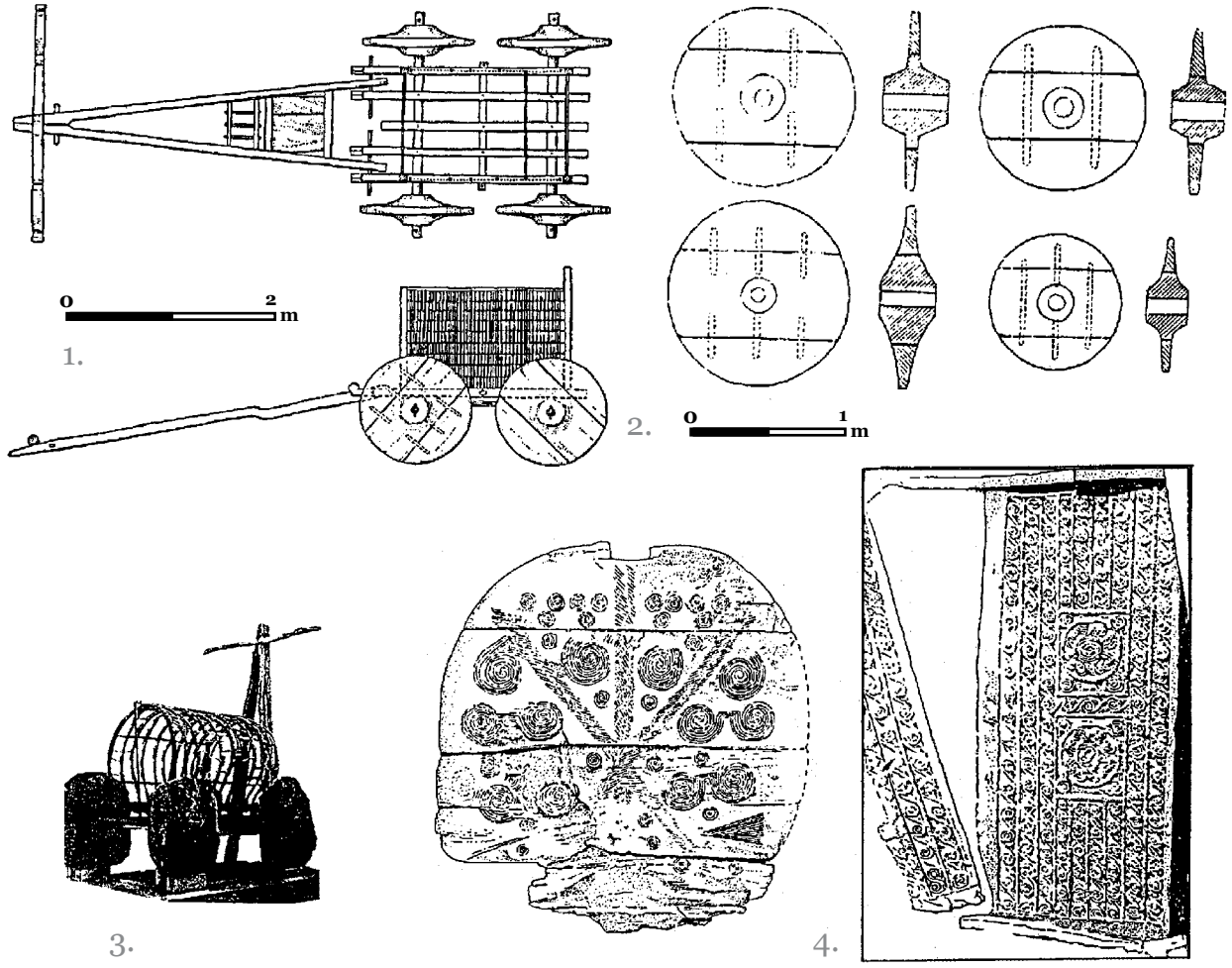


Fig. 71. Armenia. The cemetery Lchashen. 1 – carriage from the barrow11; 2 – types of three-part wheel from the cemeteries Lchashen and Trialeti; 3 – van from the barrow 2; 4 – ornamented parts of vans from the barrow 9. [Piggott, 1983, fig. 33-34, 36, 38].

These findings are typologically close to Trialeti vans, as well as to a vehicle from the mound 17 of Lower Adiaman burial ground [Lalayan, 1931]; a wooden piece of van's construction was found, richly decorated with concentric, circular, spiral and straight line carvings. Based on these findings, the ancient tradition of decorating van's walls is further developed. Ornaments of the front and rear walls of a van, except for the image of deer on the front of the vehicle from barrow 10, differ sharply from the ornamental style, known by metal items and the bulk of the ceramics in Lchashen's graves [Kozhin, 1982, p. 57].

Disc wheels of the vans are three-part with an internal keyway connection of two types and with diameter of 0.60 m – 1.7m (Fig. 71:2) were attached to the fixed axis' ends by linchpins. The basis of the body was of two longitudinal bars fixed to the axles. «A»-shaped triangular draught-pole of 3.6m long, possibly were adjusted flexibly to the frame body, which allowed to move it in a vertical plane. Crossbars of the

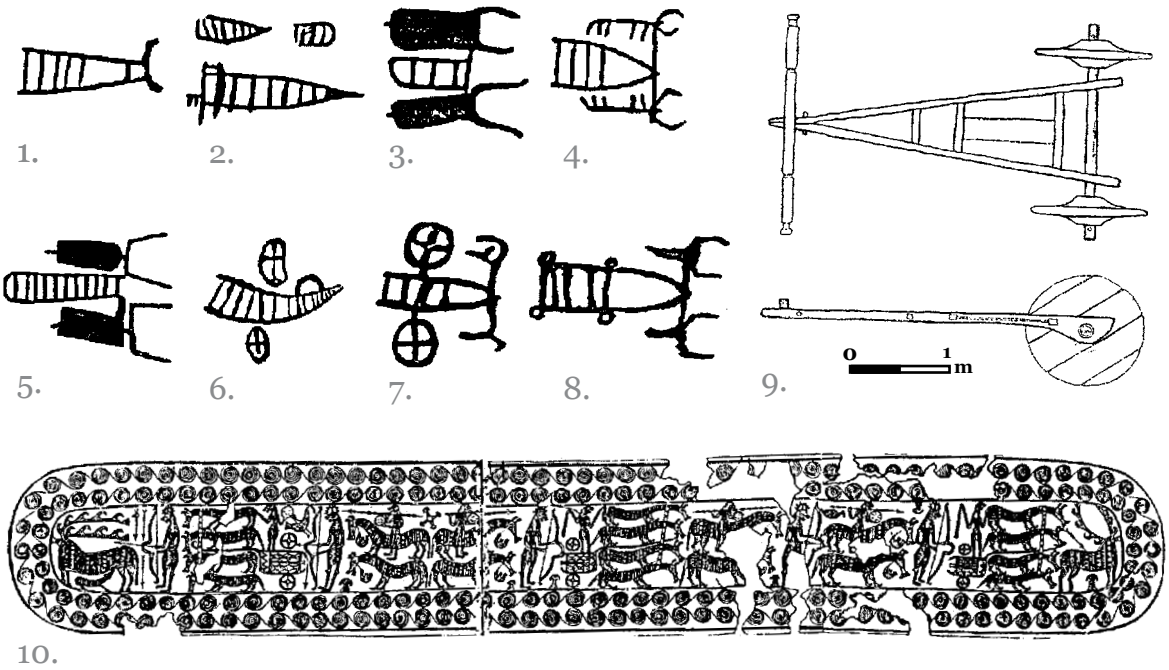


Fig. 72. Caucusus. Vehicles. 1, 4, 7, 8 – petroglyphs of Syunik, Armenia; 2, 6 – Penalsordo, Spain; 3, 5 – Fontanalba, Spain; 9 – «A»- shaped cart from Lchashen, barrow 2, Armenia; 10 – Belt from Astkhi-blur, Armenia (9 – 8 centuries BC). [Piggott, 1983, fig.37].

draught-pole are wooden bars with few twists on the ends, differing from the previous massive yokes, which consisted of two parallel bars and are known in the materials of the Novotitarov culture.

It is assumed that the lightweight yokes were fastened directly to the horns of oxen [Piggott, 1983, p. 75]. It is difficult to define the steering of harnessed bulls. Rather, it is a primitive halter or a nose ring, judging from the Middle East early findings and images of the vehicles in the mountains Gegham (Syunik, Ukhtasar, Fig. 72:1,4,7,8).

Gigs with the «A»-shaped draught-pole are represented in two copies in the barrow 2, together with a van and a 75cm long gig model; in mound 6, a gig body remained in fragments of four parallel bars connected to each other. Overlaid were remains of the deceased.

The mounds 8 and 10 contained some details of the «A»-shaped gigs, along with remains of the buried on a vehicle, with a van (Mound 10), pairs of bull and horse skulls. The gig design data are: the wheels are made of 5-6 interconnected thick boards, the axis up to 2.35 m, wheelbase – 1.7 m, total length – 3.5 m; at the base of the triangle draught-pole, before the axis of the installed are transverse bars, which form the carriage body (Fig. 72:9).

In mound 11, together with a van was found the chariot, wheels of which have 28 spokes, a body attached to the straight draught-pole has a rectangular shape and is compiled of three rectangular frames. The wheels consist of a separately done nave, a rim and spokes, which were collected into a single node and were fastened on top by a tire of rawhide (Fig. 109:2).

A set of objects from the Sevan burial grounds by numerous analogies is dated to two periods: 14-13 cc. BC and 13-11 cc. BC [Piggott, 1983, p. 77-78; Burney, Lang, 1971, p. 104-107; Maxwell-Hyslop, 1971, p. 190-192]. There is a radiocarbon dating of vehicle remains, 1200 +/-100 BC [Cherdyntsev et al., 1968, p. 423], which upon calibration became 1500 BC. The discrepancy is explained by long-term existence of this burial ground, and the similarity of Trialeti's and Lchasyen's vans suggests a more ancient their age, within the middle of the 2nd millennium BC.

Thus, in the late 3rd – first half of 2nd millennia B,C in this region actively developing were several types of wheeled vehicles:

• four-wheeled massive covered carts-vans, drawn by two oxen. The triangular design of the yoke of «A»-shaped form and methods of attachment to the animals were improved. The front walls of the vans are decorated with carved ornaments and in one case with the figure of a deer. The collective (up to 30 people) burials contained:

• an «A»-shaped gig model;

• a chariot found in the later mound 11;

• «A»-shaped gigs.

Images of the «A»-shaped carts and gigs were identified earlier: S4Wd type, subtype 4.3; 4.4., known in petroglyphs of Armenia, Scandinavia, Southern Siberia and on Indian pottery. The «articulated wagon» type originates from «A»-shaped gigs in the classification of rock images of vehicles. These petroglyphs have also a wide geography, present in Scandinavia, South Siberia and Mongolia.

A plan and a section of the burial pit of Lchashen burial mound 2 (Fig. 70:3) suggests that the two «A»-shaped gigs are located one behind another and are integrated into one articulated vehicle. Two yokes in the grave are in favor of this idea, one for the van and one for gig with a trailer. Using this type of carts allowed solving an important problem of maneuverability of heavy vehicles, as the vans had no turning front axle.

The application of exactly this constructive solution is marked by numerous ethnographical parallels. These vehicles were preserved in Asia Minor, the Mediterranean, in several regions of the Caucasus [Gegeshidze, 1966; Kozhin, 1982]. Articulated «A»-shaped carts were used, for example, with bull harnesses in the north-eastern Bulgaria and in Wales in ethnographic times [Marinov, 1973, s. 347-394, abb. 24, 30; Jenkins, 1973, p. 261-293, fig. 12]. ■

Steppes of Eurasia

Vehicles from the steppe are represented in the monuments of the Catacomb culture, genetically related to the ancient Pit's culture. The earliest carriages belong to stage III of the Novotitarov culture [Gay, 1991, p. 60-61, 68-69, 2000]. Monuments with vehicles (Fig. 73) are distributed in the Black Sea steppes, the Pre-Caucasus and Kalmykia [Kozhin, 1982, p. 64-74].

The Elista burial ground, mound 5, grave 9, contained two 1.7 m long axis with wheels, the distance between the three-part wheels is 1.3 m; the remnants of vans with arched frame were found in a mound 8, graves 6, 8, 12. In the grave 6, a van contained remains of women and children. Four vehicles in total were fixed in this cemetery [Sinitsyn, Erdniev, 1971, p. 68-71].

In the Lolinsky burial ground, remains of a vehicle was found on two small wheels 30-cm in diameter (mound 4, grave 4) [Sinitsyn, Erdniev, 1966, p. 33-43]. Among the findings were also vans closed with a vaulted ceiling in the barrow 4, graves 7 and 8. Marked were traces of felt or mat cover decoration, in the mound 4, grave 7, the rear wooden wall of van is ornamented with spirals, rectangles and triangles, as in Lchashen's vehicles.

In recent years, in the foothills and steppe regions of the Pre-Caucasus – Kuban, Dnieper, the south-western Black Sea region and other areas – a significant number of tombs was found with the remains of vehicles. At present it is the only region of Eurasia, which shows a large number of ancient tombs of this type [Safronov, 1989, p. 169-177, Gay, 1991, p. 54-71]. In the north-western Black Sea region six graves are known, in Poingulie 3, in the Dnieper 6, in the Azov Sea region 1, in the Don region 1, but in the Kuban area there is the bulk of these monuments. [Gay, 1991, p.56-58, Fig.1]. The lower Danube presents findings of models of wheels and vehicles, and in the north-western Black Sea findings of the wooden wheel from the graves (Etulia, Balabany, Chelym, etc), attributed to the ancient pit and Catacomb cultures [Gudkov, Chernyak, 1981 , p. 38-50].

In the steppe burials, as far as we can judge from the surviving parts, there are two types of gig vehicles (Ipatovsky barrow, Tyagunov grave, Pervokonstantinovka 1 \ 8) and four-wheeled vehicles: vans (Pavlograd 4 \ 18) and the «platform» carts, which, as researchers believe, carried tents [Gay, 1991, p.64]. Such a vehicle was discovered in the burial ground Ostany, mound 1, grave 160 (Fig. 74). This platform has a special fastening crosspiece and an extra wide frame, covered with an ornamented mat, which served as a floor for these mobile homes. The front of the body is equipped with a special elevation, a seat for the charioteer.

A database on vehicles, excavated in the steppe monuments, already has 248 [Izbitser, 1993] to 257 cases of finds of vehicles and their parts [Gay, 2000, p. 176], which is a solid base for the reconstruction and the study of technical characteristics (Fig. 74-76).

Analysis of the entire series of vehicles shows their significant constructive similarities, above all, among heavy dwelling van-vehicles, and all the differences are reduced to variations in the form of the draught-pole, yoke and wheel diameters [Izbitser, 1993, p. 20-21; Gay, 2000, p.187].

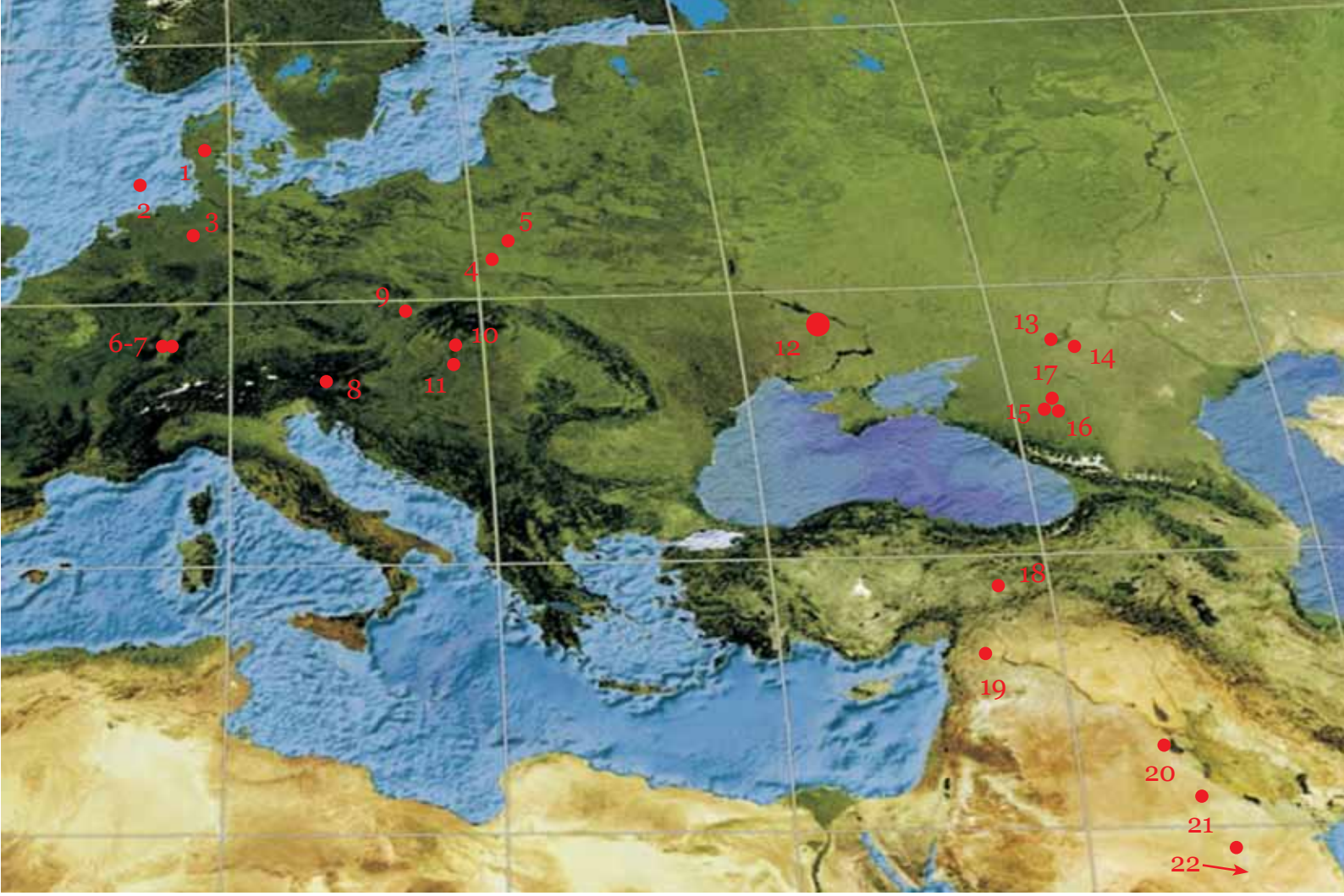
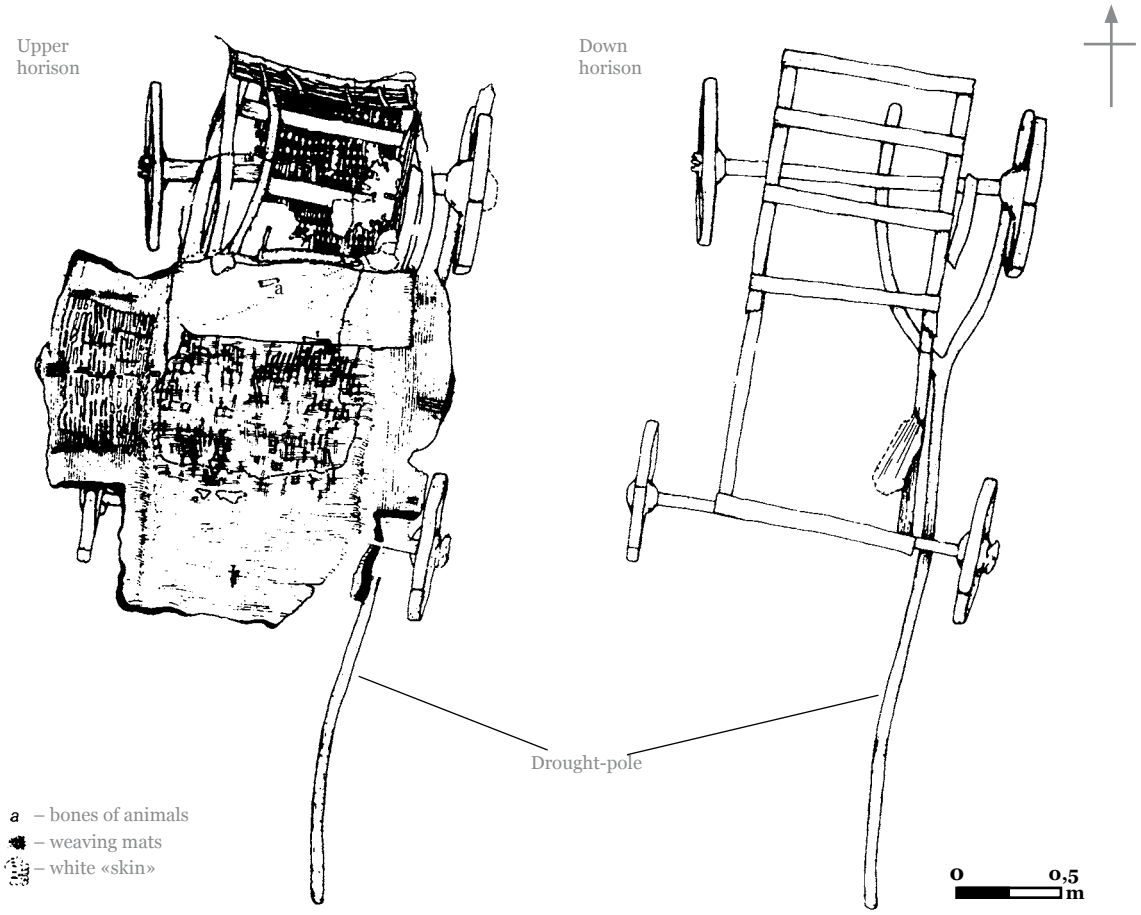


Fig. 73. Map of monuments end of 4 – 3 millennia BC. 1 – Flintbek; 2 – Moorweg XV; 3 – Lohne-Zuschen; 4 – Bronocice; 5 – Ostrowiec; 6 – Zurich – Seerosenstrabe; 7 – Zurich – Akad; 8 – Stare gmajne; 9 – Radoshina; 10 – Budekalash; 11 – Szigetszentmarton; 12 – Tripol'e-Kukuteni; 13 – Koldyri; 14 – Konstantinovskoe; 15 – Cicho; 16 – Psekujchabl'; 17 – Starokorsunskaja; 18 – Arslan-tepe; 19 – Gebel Aruda; 20 – Tel' al Uqer; 21 – Uruk IV; 22 – Harappa [Burmeister, 2004, s. 17, abb.3].

A.N. Gay classifies the birth of the Novotitarov burial rite with vehicles of the Nizhnemikhailovo-Novosvoboda tradition that found its continuation in the Late Maikop culture (Novosvoboda period), stratigraphically preceding throughout the steppe regions to the Pit's and the Novotitarov monuments dated to the end of the 4th – the first quarter of 3rd millennium BC, this period is synchronized with the discovery of «the mudbrick tomb» 6/16 of a Novoaleksandrovo burial ground 1 in Ukraine [Kovalev, 1991], one of the earliest findings of remnants of a wheeled vehicle in the European part of the continent [Gay, 2000, p. 191].

Observed are stable signs of genetic relationship and continuity of the entire suite of the steppe archaeological cultures with vehicles, and it is emphasized that such burial grounds belong to a «particular clan and family group, retaining certain vivid cultural characteristics that distinguish them from neighboring groups, and also the oral traditions which passed down from generation to generation the rules of using of separate burial mounds and whole burial grounds». This fact, as fairly thinks the author, «is particularly important in determining the cultural continuity ..... of a family and tribal groups who stepped from one culture to another, or have passed through



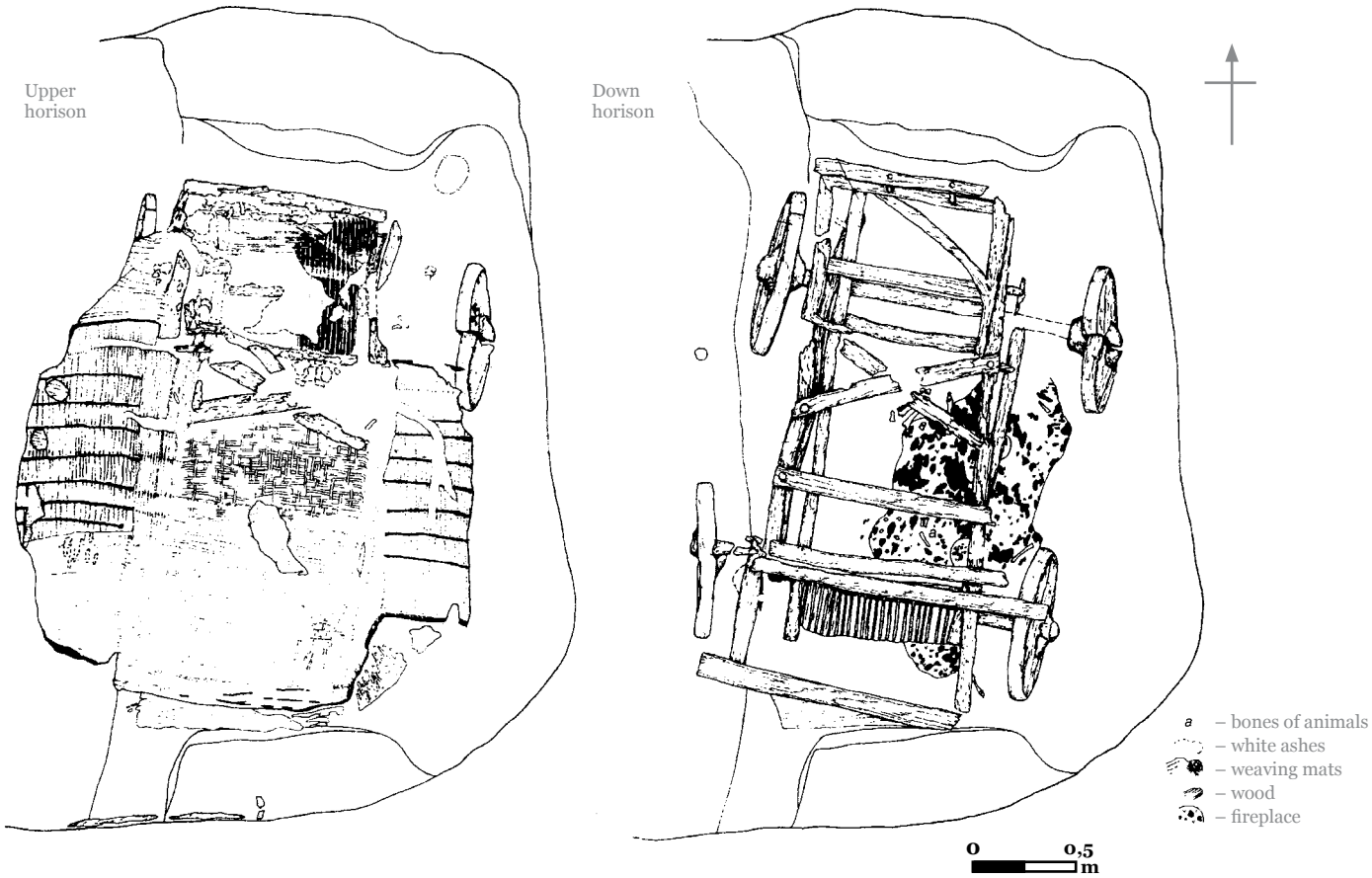
The design of the wagon. The upper and lower horizons. The cemetery Ostanyi, barrow 1, burial, 150 [Gay, 2000, p. 179, fig. 53].

several cultures which traditionally were defined as fundamentally dissimilar» [Gay, 2000, p. 192].

Dating of the steppe graves with vehicles remains controversial. The first finds were defined as a kind of ancient Pit's or a Catacomb and dated to the end of the 3rd – beginning of 2nd millennium BC [Terenozhkin, 1951, p. 53-54, Kozenkova, 1973].

In 1980s, these monuments were singled out in the «culture of vehicles and the Novosvoboda ceramics» and were declared as «the steppe filiation of the Novosvoboda culture», dated to 24th to 18th centuries BC. relationship of the culture with natives of European culture of Spherical Amphora were emphasized [Safronov, 1980, p. 10-12; Nikolaeva, 1980, p.20-30]. Geographically, the new culture covered mainly graves with vehicles in the steppe zone of the Pre-Caucasus. New finds of this type allowed to expand the boundaries of the selected culture, it was given a new name «the Cuban-Dnieper culture», and its dating changed to 23rd century – second half of 18th century BC.

At that, the antiquities of Maikop and Novosvobodnaya were opposed each other on the basis of their alleged various ethnocultural attribution. The relationship of the bloc of dolmen cultures of Novosvobodnaya, Kemi-Oba, Usatovsky with the identi-



The design of the wagon. The upper and lower horizons. The cemetery Ostanyi, barrow 1, burial, 160 [Gay, 2000, p. 183, fig. 54].

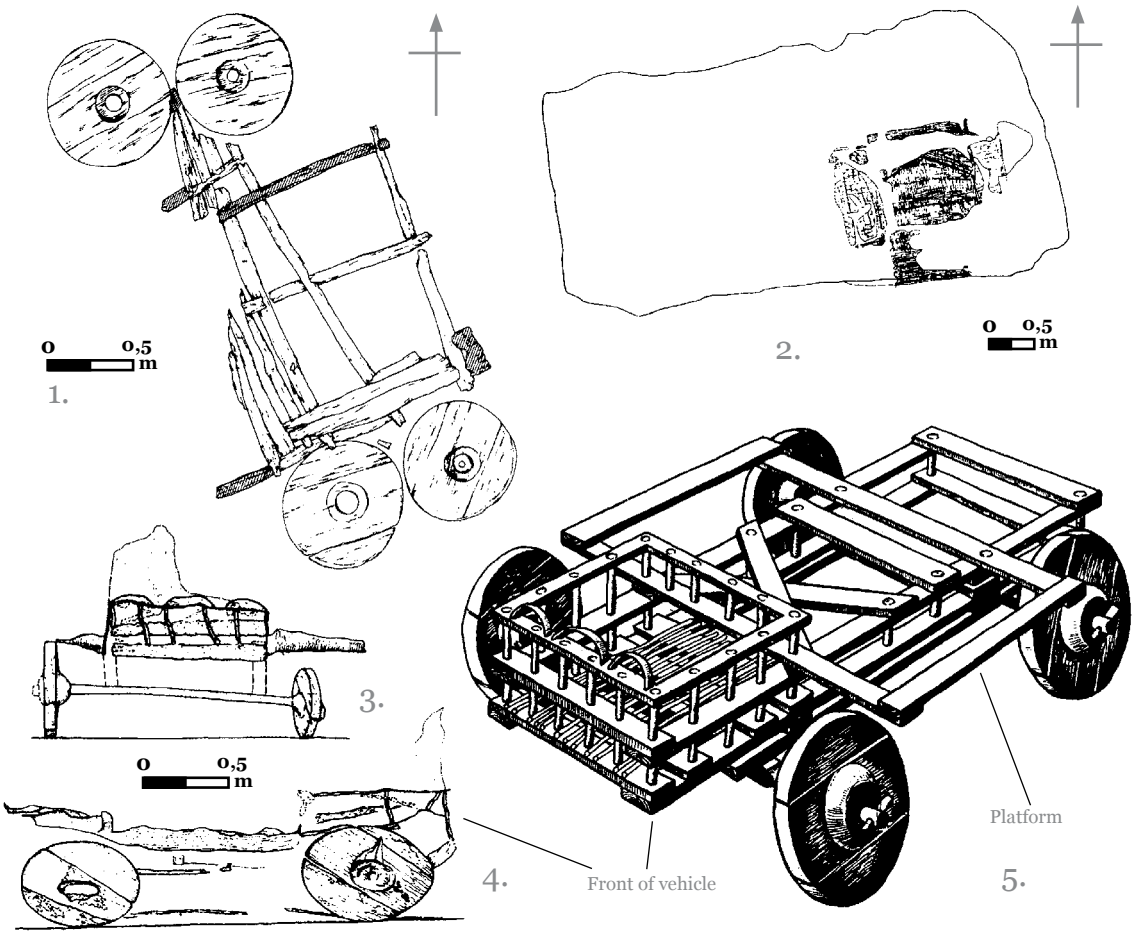
fied Kubano-Dnieper culture was substantiated [Nikolaeva, Safronov, 1983, p. 43-83, Safronov, 1989, p.175, 205-217].

An alternative view [Gay, 1991, p. 54-71, 2000; Trifonov, 1982] formulated the concept of the Novotitarov culture, which geographically covers a fairly compact group of monuments with vehicles on the east coast of the Azov Sea and is pre-Catacomb in nature.

The singled out culture organically fits the area of similar cultural formations located in the southern periphery of the Pit's cultural and historical region. Attributed to them are: some ancient Pit's monuments of the Budzhak groups in the North Black Sea, Staroselsky group in the Lower Dnieper [Shilov, 1982], part of the monuments of the steppe and foothill Crimea attributed to the Kemi-Oba culture [Schepinsky, Cherepanov, 1969].

All of these groups date back to the second half of the 3rd millennium BC.

At the turn of the 3rd – 2nd millennium BC, derivatives of the Novotitarov culture appear to east, the Arhara horizon (burial ground Tri Brata, Fig. 77) in the monuments of Kalmykia [Shilov, 1982]. Observed are relationship of the Novotitarov and Bedenski cultures in Georgia. The «core» of these similar groups, the Novotitarov culture, dates back to 27th – 22nd centuries BC, which was supported by radiocarbon dating.



Reconstruction of Novotitorovskaya wagon, made by the finds from the graves of 150 and 160 of the barrow 1, Ostanyi cemetery. [Gay, 1991, Fig. 3, 6, Gay, 2000, p. 185, fig. 55]. 1 – Lebedy I 2/116, the lower horizon; 2 – Malai I 9/25, the upper horizon; 3 – Ostanyi 1/150, as seen from the North or the front of the carriage 1; 4 – the same from the East; 5 – Reconstruction of cart (no mats, flooring and tent).

The main difference between the two concepts on the steppe culture with vehicles, apart from the name, in defining the lower dating limit, related to understanding by the authors of the chronological position of the Maikop antiquities, which in their turn, acquire a key importance in this issue.

Differently authors perceive the genesis of this culture: in the first case, the migration from Eastern Europe of its natives and a corresponding opposition of the ancient steppe monuments to that of the Pit's and Maikop, and in the second, on the contrary, local development within the ancient Pit's cultural-historical area (meant by N.J. Merpert) under undeniable influence of the Maikop-Novosvobodnaya component.

The stratigraphic position of these monuments combines the two concepts. The earliest monuments of the Petropavlovsk group replaced the Novosvobodnaya in the Kuban and, apparently, some period coexist with the Early Pit's, Novosvobodnaya and Maikop monuments. In the next stage, the Novotitarov culture monuments are located always above the ancient Pit's and the Novosvobodnaya monuments. Burials of the last stage are preceding the most an-

cient burials of the Azov's Catacomb culture (monuments of pre-Donetsk type) [Gay, 1991, p.66-67, Safronov, 1989, p. 211-213].

The burials with vehicles are also known in other steppe regions: in the Stavropol region, the Vesiolaya Roscha village, mounds (no. 7, 10, 15, 16) in diameter of 50-56 m and 2.8 m high contained vehicles in the inlet catacomb tombs, while the main tombs were of the ancient Pit's. Remains of six vehicles were found. In the mounds 15 and 7, graves 7 and 9, vehicles stood at the entrance to the catacombs. Wheels are three-part or multipart, with key joints, 55-62 cm in diameter; the body is a rectangular frame from 85x125 cm to 110x145 cm; in some cases, frame was reinforced by a crosspiece, as in the Novotitarov vehicles of stage II. Marked were wooden pins from the body carcass, perhaps, of the arch type. The bottom of the vehicle was covered with reeds, probably, remains of the overlapping mat. All vehicles are made of poplar, aspen, elm and ash.

Other type of graves was recorded, when wheels, removed from the axes, were laid in the corners of the frame (Fig. 78). The graves with vehicles date back to the turn of 3-2 millennia BC or the very beginning of the 2nd millennium BC [Romanov, 1982, p. 102-108].

In the Crimea, near Sivash, a mound was excavated 2.2 m high, 60 m in diameter. Inside 30 tombs of different periods were fixed, grouped around the ancient Pit's. There was a coupled grave in one of the catacomb burial chambers (Grave 28). At the waist level, found were: a bronze ornamented plate, a drilled dog's canine tooth, a piece of ochre, a clay pot and other items (Figure 79). Four wheels and a sack of wheat were laid at their feet. Two wheels were laid flat, slightly covering the sack, the other two were standing upright. The wheels are made of oak, three-pieced, with the internal keyed joints. Two-way naves. Wheel edges had 2 cm thick bevels, which implies a certain «camber», originally imbedded in the design of vehicles. The wheels rotate on a rigidly fixed axis, and were fixed with linchpins attached to the axis by a leather strap. Marked were 1.2 cm wide traces of a chisel on the wood; holes were drilled by a flint drill of the same diameter. Researchers interpreted the tomb as a cult burial, noting a special sacred role of dogs in the mythology of the Indo-European Unity period [Korpusova, Lyashko, 1990, p. 166-175].

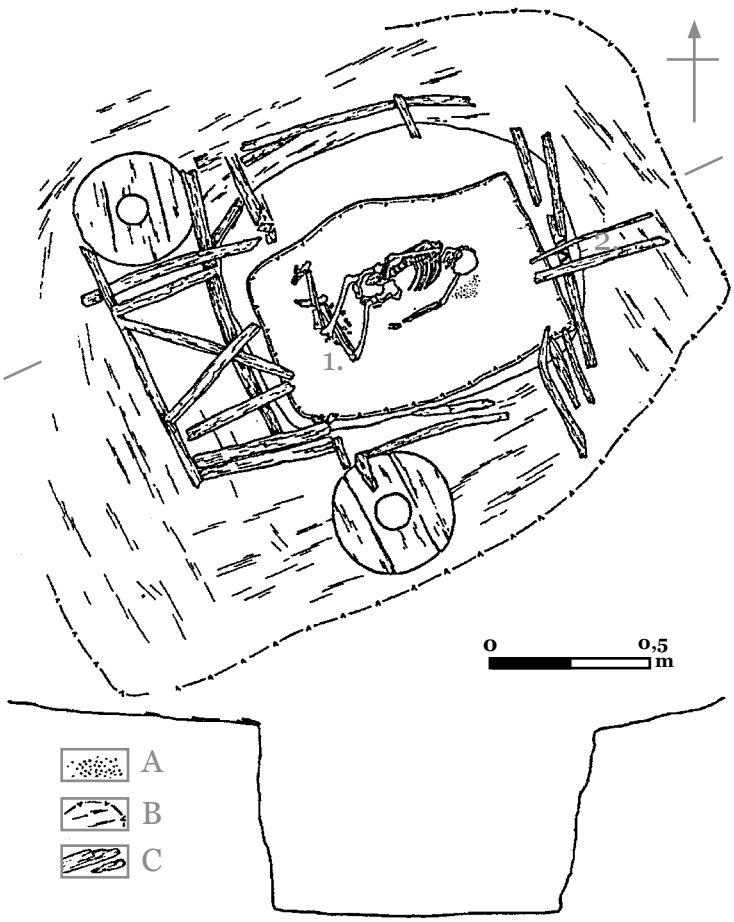


Fig. 74. The steppe zone. Burial of the first stage of Novotitorovskaya culture (Lebedy I, barrow 2, Grave 119). 1 – drilled astrogals of sheep; 2 – picture of red paint; A – raise a red paint; B-black cane in ashes; C – rotten wood. [Gay, 1991, fig. 2].

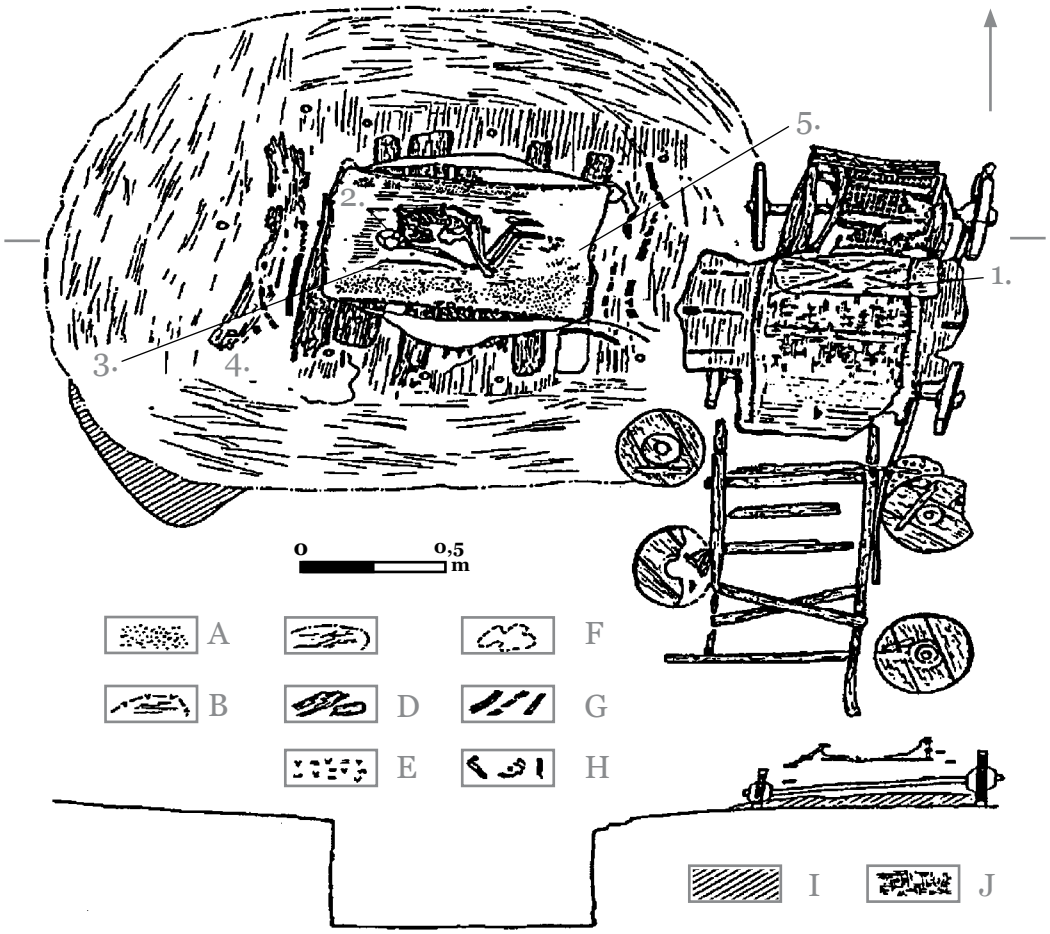


Fig. 75. The steppe zone. I: Burial of the second phase of Novotitorovskaya culture (Ostanyi, barrow 1, grave 150). 1 – the ribs of a large animal; 2 – silver temporal rings; 3 – spine of fish; 4 – cluster fish scales; 5 – bony tube, painted with red paint;
A – raise a red paint; B – black jungle of rotting litter; C – gray white cane ashes; D – rotten wood; E – fireplace; F – white ashes; G – bands of red paint on the mat; H – black paint on the mat and wheels; I – sand from the grave; J – weaving mats [Gay, 1991, fig. 3.6].

Not far from the Zaporozhie city, on the right bank of the Dnieper river, at Marevka village, in the southwest field of the «Tyagunov Grave» mound, (barrow 11, grave 27) a two-chambered catacomb was excavated; in the first chamber, skeletons of four people were found, of two adult men, a woman and a child lying on the plant bedding. A skeleton of one man was preserved in anatomical order, of the others were dismembered. Nearby were the remains of a gig, placed in the chamber. The upper part of the body and one wheel were badly damaged during the excavation. Well-preserved was lower part of the body as a whole wooden block, hollowed out like a trough, 1.2x0.74 m, 0.15 m high; the front of the body was oval. Sides of the vehicle consisted of several thin slats of wood, sub-rectangular in section. Remains of the draught-pole with a characteristic bend were laying near the railing of the left side. One wheel made from a single piece of wood 0.6 m in diameter survived. A bronze sharp object was found near the vehicle, it

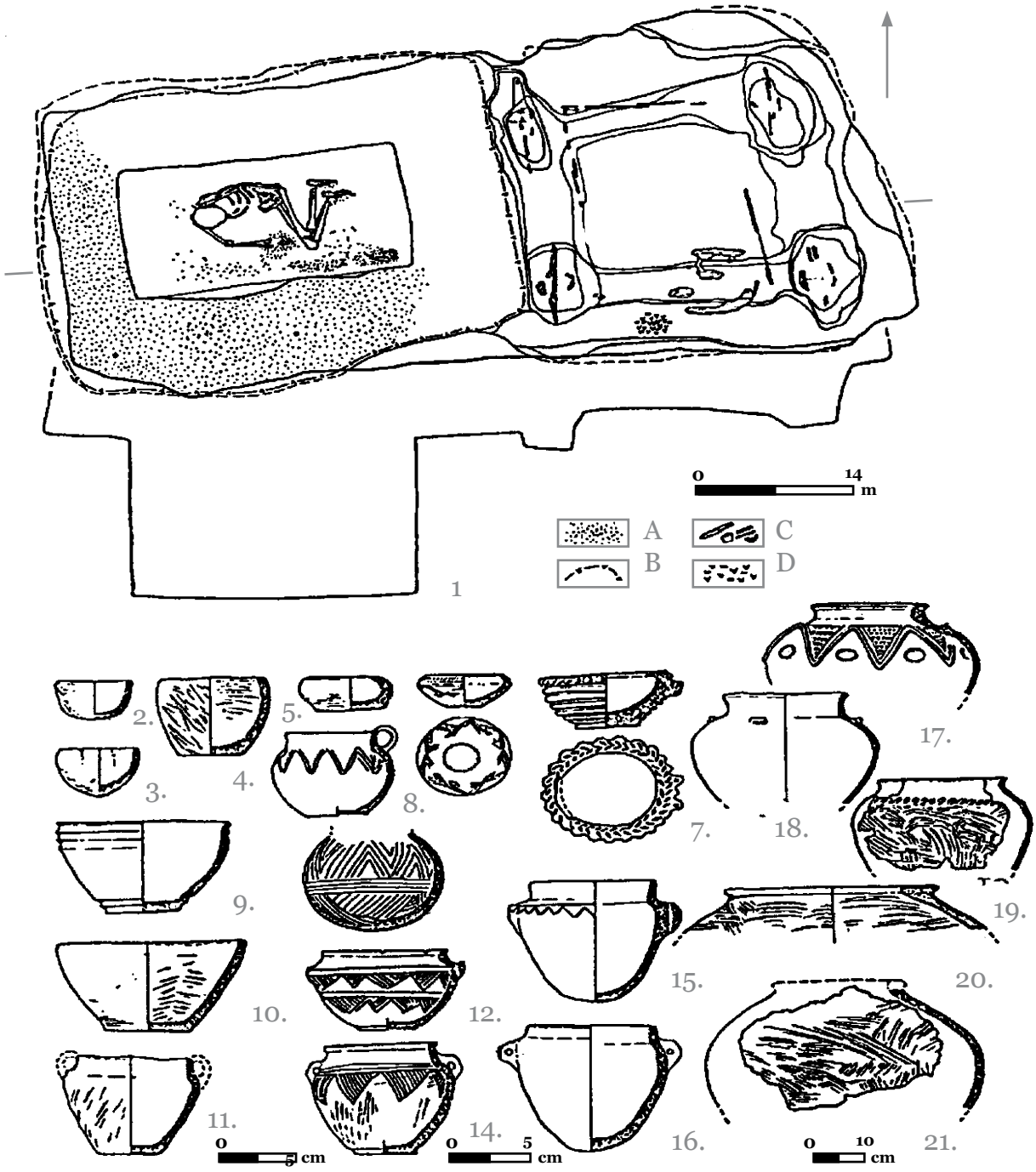


Fig. 76. The steppe zone. Burial in the «protokatakomba» of the Third phase of Novotitorovskaya culture (Malai I, Barrow 9, Grave 25). 1 – a stone hoe; 2 – silver rings; 3 – the skull and leg specimens of sheep and goats; A – sprinkling with red paint, B – black ashes; C – rotten wood; D – fireplace. Dishes from the Novotitorovskaya graves: 2,11 – Lebedy I, barrow 2, finds in the mound; 3 – Lebedy I, barrow 2, grave 73; 4 – Malai I, barrow 9, grave 14; 5 – Lebedy I, barrow 2, grave 100; 6 – Malai II, a mound, finding in the embankment; 7 – Plastunovskyi I, barrow 2, grave 26; 8 – Lebedy I, barrow 2, grave 61; 9 – Lebedy I, barrow 2, grave 112; 10 – Greki I, barrow 2, grave 78; 12 – Lebedy I, barrow 2, grave 120; 13 – Malai I, barrow 9, grave 11; 14 – Malai I, barrow 9, grave 24; 15 – Tzarsky, barrow 1, grave 7; 16 – Lebedy I, barrow 7, grave 7; 17 – Olennyi I, barrow 2, grave 25; 18 – Ostanyi, barrow 2, grave 15; 19 – Plastunovskyi I, barrow 2, grave 11; 20 – Olennyi I, barrow 3; 21 – Lebedy I, barrow 2, grave 116. [Gay, 1991, Fig. 4,5].

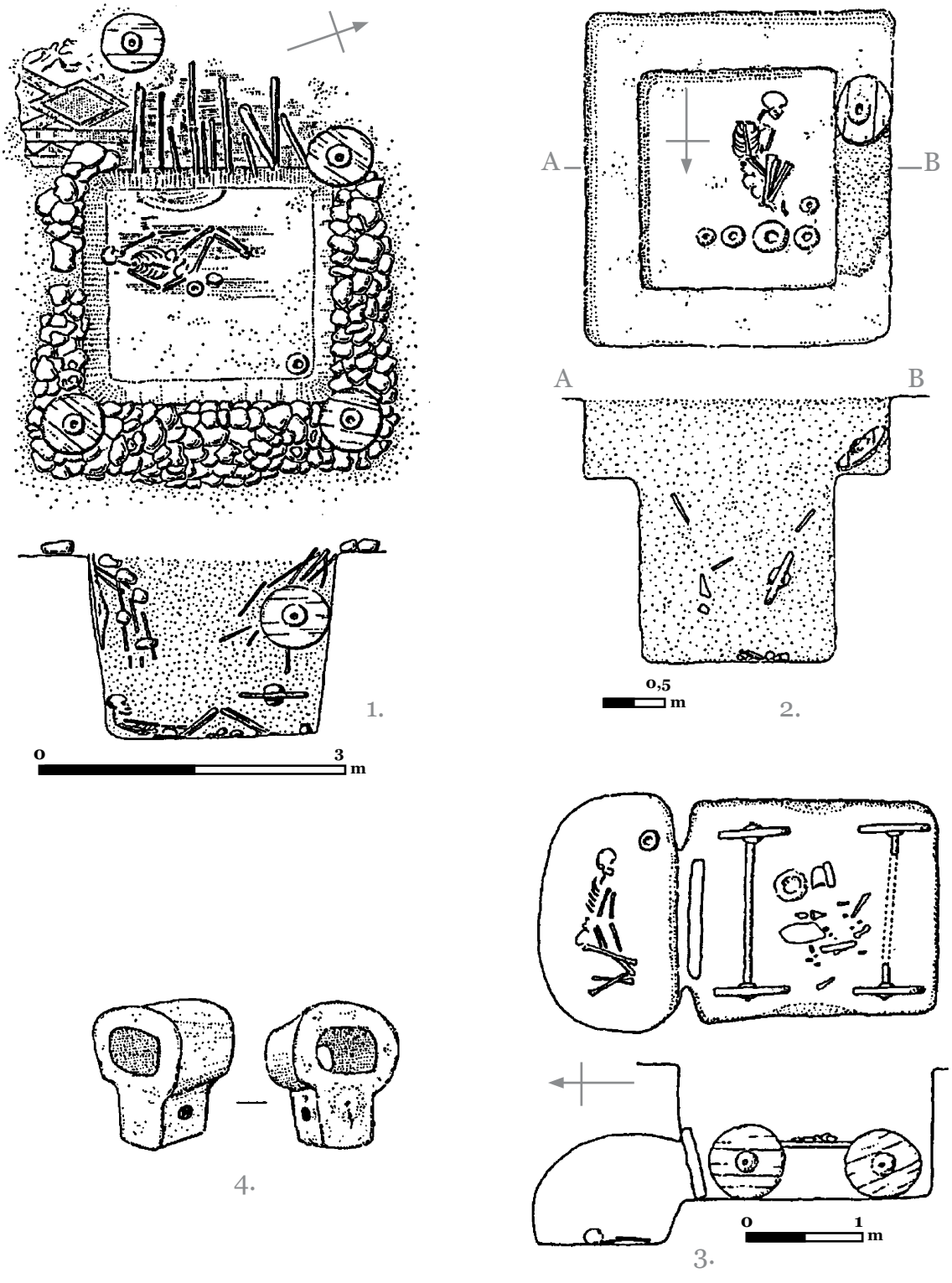


Fig. 77. Kalmykia. The graves with wagons. 1 – Tri brata (Three Brothers) cemetery; 2 – Arkhara cemetery; 3 – Elista cemetery, barrow 5, grave 9; 4 – clay model of covered carts, Three Brothers. [Piggott, 1983, fig. 23-26].

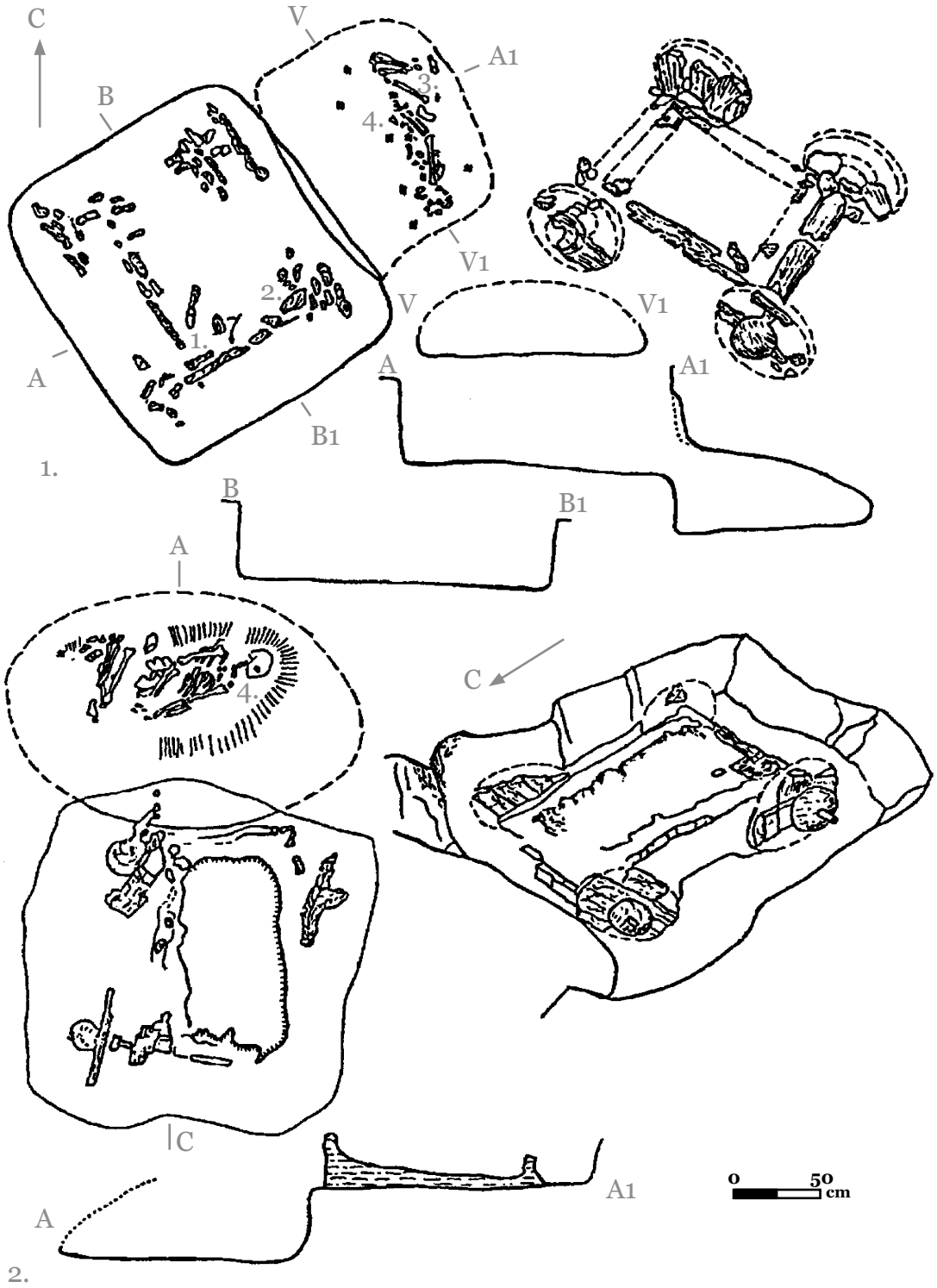


Fig. 78. Stavropolie. The cemetery at Vesiolaya Rotsha river. 1 – barrow 7, grave 7; 2 – barrow 15, grave 9; 1 – sheep's shoulder; 2 – bronze awl; 3 – bronze knife; 4 – beads. [Romanova, 1982, Fig. 3]

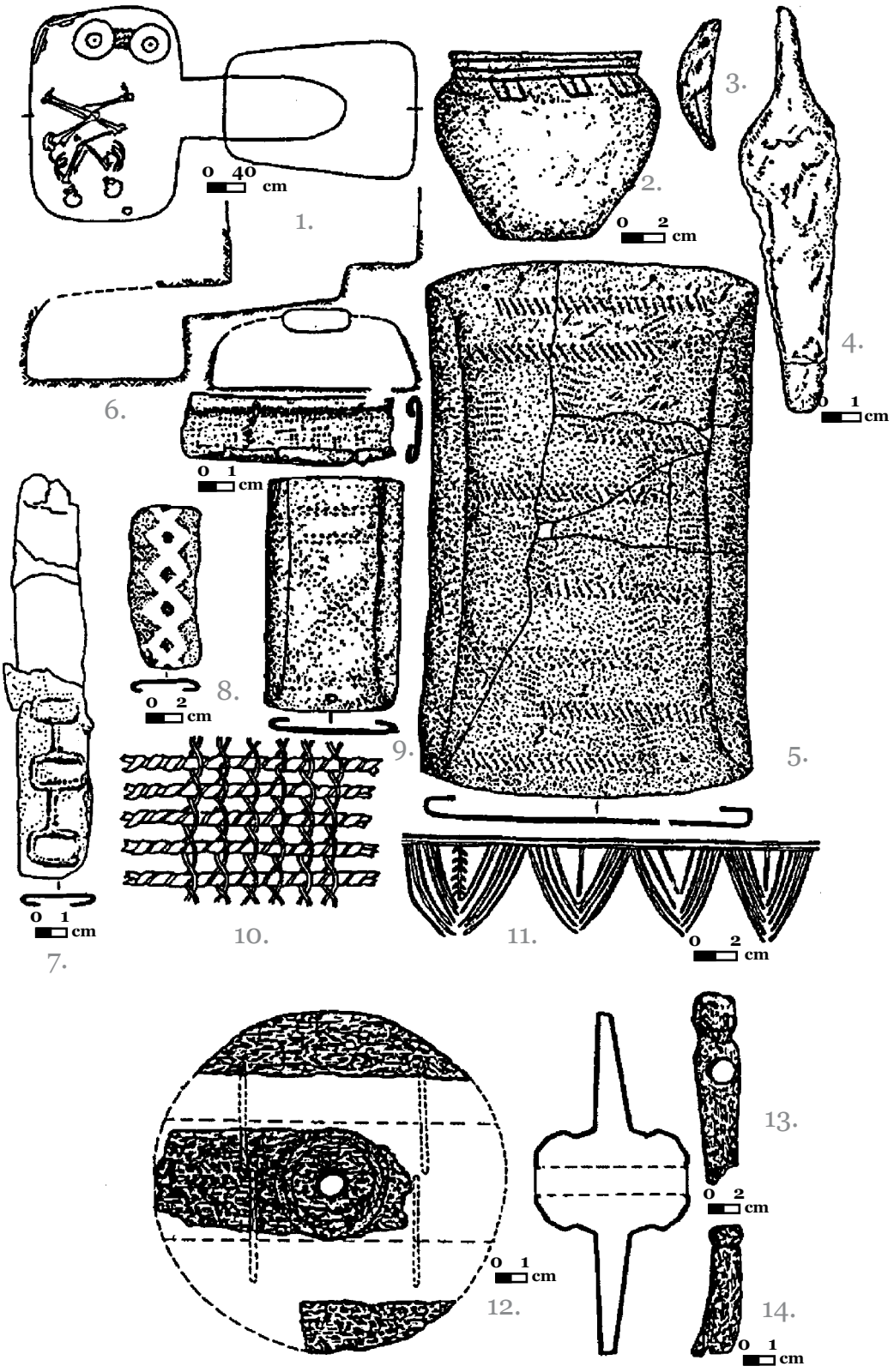


Fig. 79. Crimea. The cemetery at Bolotnaya, barrow 14, grave 28. Findings. 1 – Plan and section of the tomb; 2 – a vessel; 3 – canine touth; 4 – a bronze knife; 5-9 – bronze plates; 10 – structure of the fabric of the bag; 11 – sweep of the ornament of the vessel; 12 – reconstruction of the wheel; 13-14 – survived details of the construction. 1-5,10,12-14 – Bolotnaya, barrow 14, grave 28; 6,7 – Ackerman I, barrow 4, grave 1; 8 – Primorsk, barrow 1, grave 5; 9 – Kamenka Dneprovskaya, barrow 11, grave 10; 11 – Filatovka, barrow 8, grave 11. [Korpusova, Lyashko, 1990, Fig. 1,5].

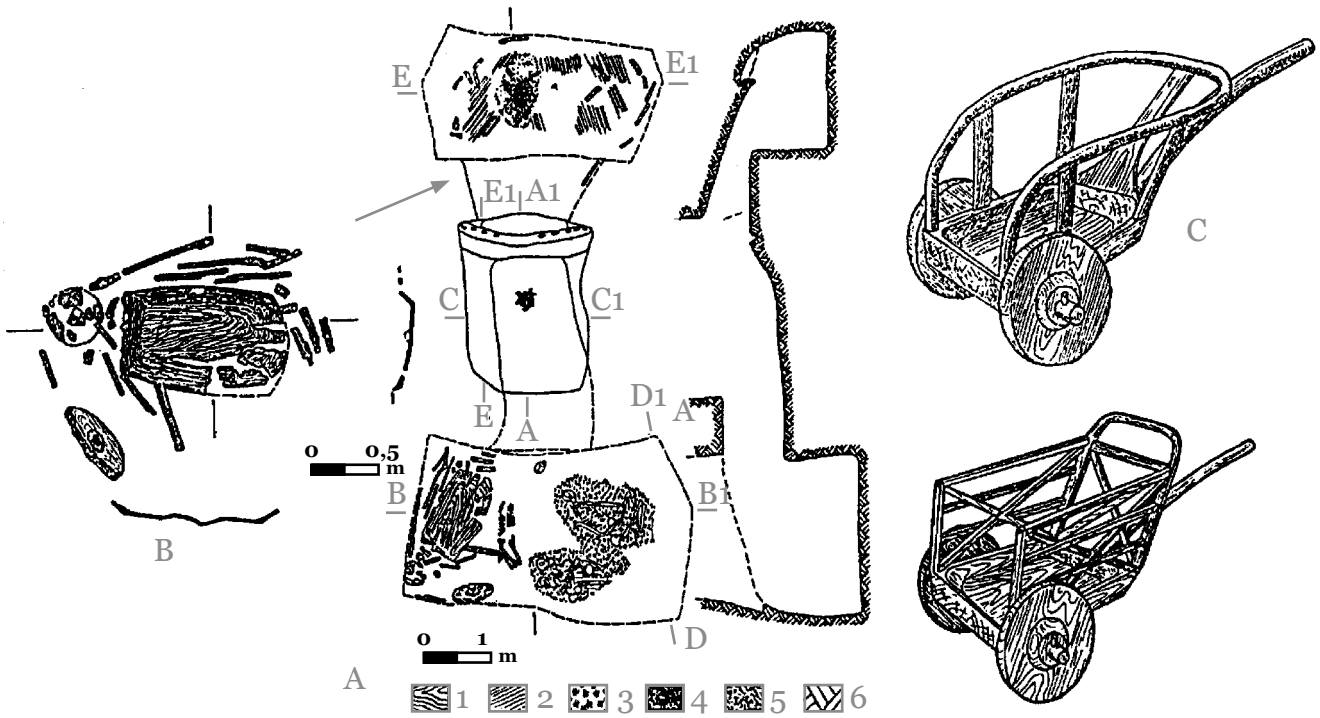


Fig. 80. Lower Dnieper. Tyagunov grave, barrow 11, grave 27 at Marevka. A – Plan and sections of the grave: 1 – tree; 2 – stones; 3 – burial box; 4 – ignited primer; 5 – coal; 6 – mainland; B – plan and sections of the remnants of the cart; C – two versions of the reconstruction of the cart. [Cherednichenko Pustovalov, 1991, fig. 1,3,4].

was a goad with preserved wooden handle: length of the bronze tip, square in section, was 1.1 cm, length of rounded handles 2.2 cm; two options for the reconstruction of the gig were suggested (Fig. 80).

The burial dates back to the turn of 3-2 millennia BC, or the last three centuries of the 3rd millennium BC [Cherednichenko, Pustovalov, 1991, p. 206-216].

The most eastern finding of a wheel occurred in the Urals, in the cemetery Gerasimovka I, mound 7, grave 1. The wheel 50 cm in diameter, cut from a single piece of wood, was located next to the buried. The monument contained multicultural materials, dating of which is quite complicated [Fedorova-Davydova, 1971; Merpert, 1974, p. 94].

As we see, two types of vehicles were actively developing in the steppe region: vans and one-axial gigs on disc wheels of different designs, genetically close to two identified types of vehicles in the ancient Near East, of the end of 4th–beginning of 3rd millennium BC. Innovations were concerned with installation on vehicles of a more spacious homes and making the very vehicle much lighter by reducing the wheels' diameter.

It also might be connected to attempts to use faster horses and to increase the loading capacity of vans. Evolving was a tradition of decorating mats covering walls and floor of vans, as well as decorating the front and rear walls. Illustrative to this are a van and gigs on small (up to 30 cm in diameter) disc wheels, found in Lolinsk burial ground. Ornamented with spirals, the van and gigs obviously became «prototypes» for types C4Wd, identified in petroglyphs and imprinted on the Znamenskaya stele in the Minusinsk Basin, and for S2Wd, subtype 2,

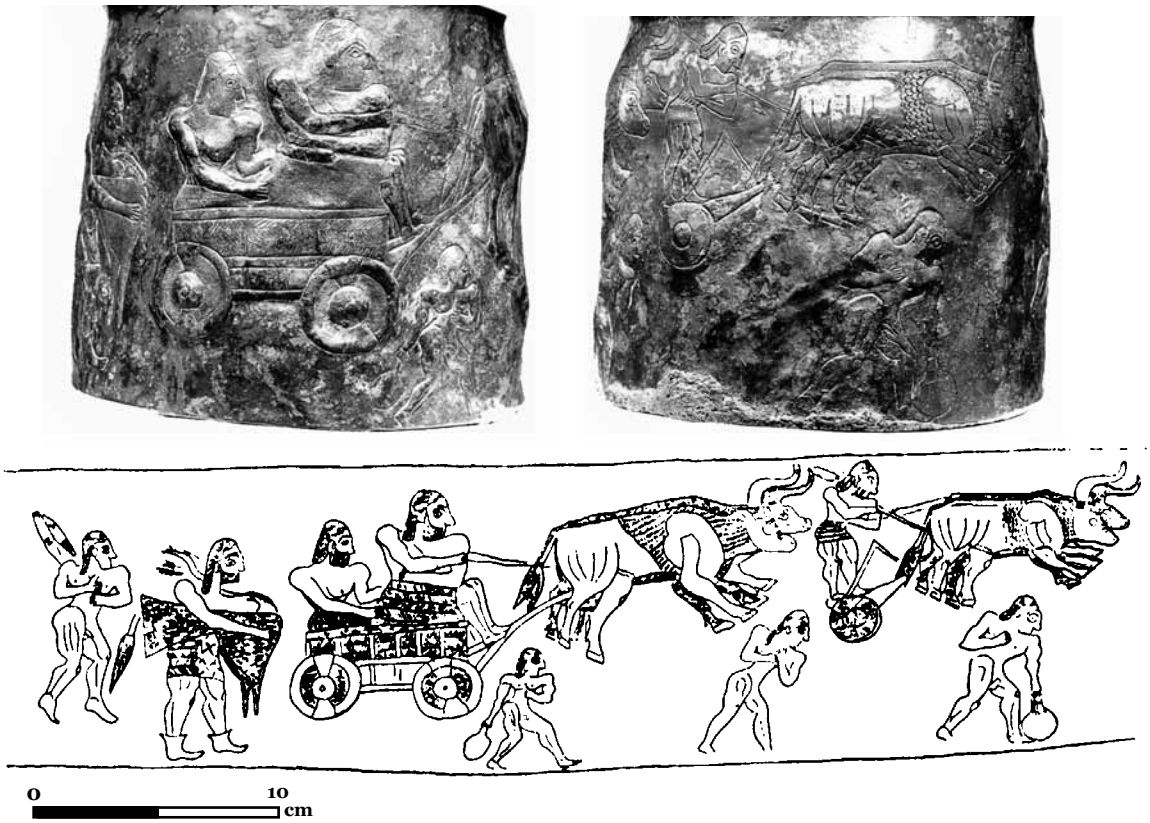


Fig. 81. Silver vessel from Bactria. Louvre, AB 28 518. Height – 0, 132 m, diameter – 0.143 m. [Foto Musee du Louvre].

spread in petroglyphs of the Altai, Western Tien-Shan, Pre-Tyan-Shan and Scandinavia.

Researchers indicate two variants of the funeral rite of installing a van in a tomb: either assembled, or disassembled, when wheels lie at the corners of a grave/van's frames. There is the cult of the dog, which coincides with a previously identified fragment of «the pictorial series» on vehicle subjects in petroglyphs: vehicle> .....> Dog> .....>.

An usnequivocal analogy with the material of the Middle East monuments suggests presence of a stable channel of communication between peoples of the Pre-Caucasus steppes and the Middle Eastern city-states. Having expressive artifacts of the Maikop culture and all necessary factors, we can assume a direct migration of individual groups from the Middle Eastern city-states via the Caucasian Range to the Pre-Caucasus steppes; or bypassing the mountains, along the coastal of the Caspian Sea. Further, in this chapter, I shall return to this issue.

From this brief review it follows that in the 3rd – early 2nd millennium BC oxen were the main type of draught animals harnessed in a team. Heavy, clumsy vans and carts perfectly corresponded to physical might of the animals, which is confirmed by finding of pairs of skulls in Lchashen's graves. Lasting use of the traditional bull pair harness in ancient societies is confirm by the findings of their images on wooden planks from the Tepsey vault in southern Siberia, dated to 4-3 centuries BC [Gryaznov, 1979, p. 103, fig. 61] and on a silver vessel from Bac-

tria. The images show bulls pulling carts or gigs and being steered by the two ropes and a goad (Fig. 81).

In the ancient Near East, attempts to harness equines – donkeys, mules – into special two-wheeled vehicles, were made very early. Judging by the finds of quite light gigs and skulls of horses in the Lchashen graves, people of those societies tried also to harness the horses. Not excluded is the possibility to harness animals of different species in one team, which has numerous ethnographic parallels, for example, in India and Pakistan; or harness animals so unusual for this purpose as goats.

Two-humped camel was an important draught animal during this period. A very early invention in Turan of a shaft harnessing method, best suited the anatomy of camel, might be propelled by the need to use this animal perfectly convenient under conditions of semiarid and arid regions. Interesting that all vehicle images known in petroglyphs with harnessed camels were found in such areas: Baikonur, Karatau, Bukantau. Most likely, the camel was eventually domesticated at the same time as the horse. Anatomical features of the two-humped Bactrian camel, namely the presence of a ledge between the humps, led to inventing of a natural and convenient form of a yoke, which enabled an efficient transmission of the animal's draught effort directly to a vehicle.

Based on osteological material from the archeological monuments of Kazakhstan, findings of camel bones are rare in Neolithic monuments, with dramatic increase in number in the Bronze Age burial grounds: Telzhan-Kuze, Aksu-Ayuly, Begazy, Mily-Kuduk and settlements: Atasu, Alexeyevsky [Nurumov Makarova, 1988, p.25; Tsalkin, 1972, p.77; Margulan, 1979, p. 258-259]. Camel-breeding, obviously, was practiced in this period only in Central Asia, and lat-

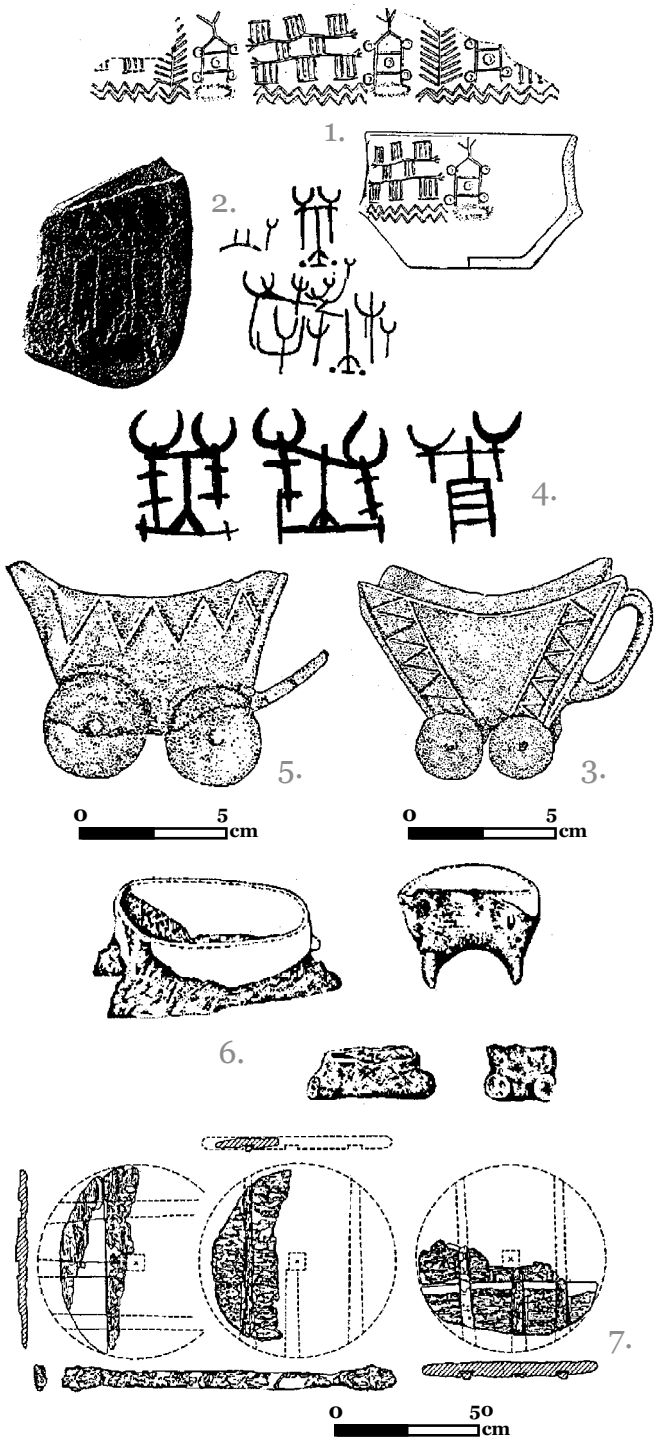


Fig. 82. Eastern and Central Europe. 1 – vessel with a picture of a cart, a settlement Bronositsy, Poland; 2 – images of carts on the slab graves, Lohne-Zuschen, Germany, 3 – model of the vessel from Segetsentmarton; 4 – petroglyphs, Kamennaya Mogila; 5 – a vessel model from Budekalash; 6 – clay model of slides, culture Tripolie-Cucuteni; 7 – three-part disc wheels, Zurich, Switzerland. [Piggott, 1983, fig. 6, 13, 19; Kyzlasov, 1986, fig. 113].

er, by natives of the Andronovo and Tazabagiyab cultures [Itina, 1977, p. 138, 185-190; Kuzmina, 1980, p. 30].

There is only one kind of camel, two-humped Bactrian, in petroglyphs of Middle and Central Asia, while in the ancient Near East habituated one-humped dromedary. Therefore, images of the Bactrian, and not dromedary, fixed in the earliest records as a harnessing animal in Turan's wheeled vehicles is an important evidence of local innovation in the design of a harness of locally used vehicles.

The economic role of camel led to the creation of its cult, which is brightly reflected in the Indo-Iranian religious tradition. In the Avesta, it appears many times and is a main sacrificial animal [Videvdat, 9, 37, Yasna, 44], as an incarnation of the wind god Vayu, the god of storm and victory Veretragna [Bahram Yasht, 8] and the personification of Fame, Farn [Zamyad Yasht, 34-38].

In the Indo-Iranian languages, in contracts to other Indo-European languages, the camel is named by a word «ustra», common to the Old Indian and the Avestan languages. Naming of one-humped dromedary, gamal, in other Indo-European languages is a later borrowing from the Semitic. Same names for the camel may indicate the fact that the Indo-Iranians got to know the animal after they had left their common Indo-European homeland, before their split into ancient Indian and Iranian branches [Kuzmina, 1980, 1988, p.353, 1994]. ■

Eastern and Central Europe

Since the days of B. G. Childe, new data on the early history of wheeled transport appeared in Europe. Among them is the contour image of cart with the draught-pole in plan, which is part of the ornamental decoration on a clay hand-shaped pot from Bronositsy (Fig. 82). This two-layer settlement is located 45 km north-east of Krakow in southern Poland. The pot was found in the settlement's III-phase layer, dated by radiocarbon method to 2750-2550 years BC and attributed to the culture of funnel cups (TRB) [Piggott, 1983, p. 41, fig. 10-11; Kruk, Milisauskas 1977, 1981; Bakker, 1976, see: Safronov, 1989, p. 178].

Another finding comes from a settlement Radoshina of a Boleraz group in Slovakia. This is a clay object of rectangular shape, with dimple-ornamented edges and protomai of bulls (?) on the front wall, which, in turn, ends with an arched pommel. Wheels and their assembly nodes were not fixed. [Nemejcova-Pavukova, 1973, p. 300, fig 3].

In the Late Baden (Petchsel's) graves contained peculiar ceramic pottery models of carts with high, as of a trough, boards, decorated with geometric ornaments (Budekalash, Grave 117, north of Budapest, and Segetsentmarton, 32 km north of Budapest) [Banner, 1956, pl. 120; Bona, 1960, p. 83-111; Kalits, 1976, p. 106-117, Safronov, 1989, p. 168-169]. A strikingly similar type of such cart with high and sharp sides was found thousands of kilometers to the east, in Khakassia, on the stele at the

station Ust-Byur. The dating of the model-pots is defined in the range of 2500 – 2200 years BC [Piggott, 1983, p. 45].

In 1884, in the town of Lone (Zuchen) in Germany, a stone box was unearthed, one of the slabs of which contains pecked images of two- or four-wheeled vehicles on small wheels, drawn by a pair of oxen, in plan. The figures are unclear and badly damaged by chips to slab. Similar vehicle images were found in Geghams mountains (Syunik, Ukhtasar in Armenia) and in petroglyphs of Kamennaya Mogila near Melitopol.

Vehicles with oxen as draught animals, which are arranged one above the other, are pecked on a slab 2 in the Kemmo (valley Camonica) in northern Italy. They were dated by changes in style of third phase, i.e., to the end of 3rd millennium BC [Anati, 1975]. Dating of the finds in Lone is complicated by poor quality of the first publication. Some of the pots from the tomb can be attributed to the culture of funnel cups, to 2600-2200 BC [Piggott, 1983, p. 43-44].

The above listed findings and their radiocarbon dating became main arguments for the concept of European origin of wheeled vehicles [Safronov, 1989, p.155-179]. I believe that these findings cannot be a decisive witness of widespread use, and especially of the origin, of the wheeled transport in the Neolithic societies of Europe, since they actually document the fact of getting familiar with the wheel inasmuch, as in Turan and Harappa.

Routine use of vehicles is proved by findings of remains of vehicles in graves when they already become a stable element in the mythological worldview of a society, a key image of communication. It is hard to believe that given the proper degree of knowledge on archaeological monuments of prehistoric Europe, such graves are not yet found and, on the contrary, in the later historical periods, such graves are found

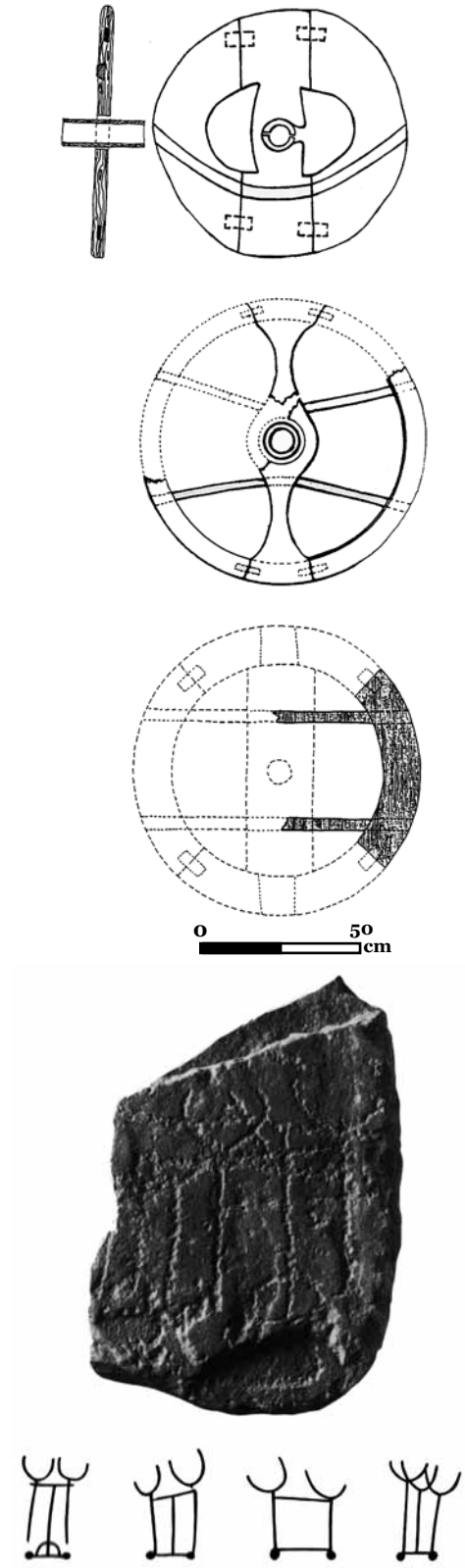


Fig. 83. Europe. Wheels of Mercurago I. Northern Italy. [Schlichtherle, 2004, s. 309, abb. 15]. Slab from the tomb of Lohne-Zuschen [Bakker, 2004, s. 289, abb.9].

Clearance of «A» shaped draught-pole in the peat bog. [Schlichtherle, 2004, s. 303, abb. 11.

in large quantities. References to the Hungarian graves of the ancient Pit's culture Keted'haza are baseless, because there was not found a wheel [Safronov, 1989, p. 166-167].

The real evidence of use of vehicles by ancient Europeans was discovered in peat bogs and other places of the Netherlands, Denmark, Switzerland and Northern Italy [van der Waals, 1964, p. 51-75; Piggott, 1983, p. 49-51]. These are one-piece (De Esse, The Netherlands) or three-piece disc wheels with the axis (Zurich, Switzerland), not associated with burials, isolated finds from road sides or near the ancient roads (Fig. 83). All radiocarbon dates of these wheels are within the second half of 3rd millennium BC (2340-2010 BC).

Only the images on a stone box slab in Lone can be viewed as the only serious argument in favor of the concept of European origin of wheels. Here, vehicle images are an integral part of a burial rite and may indicate an association of the deceased with wheeled vehicles. If it is so, then we should explaine their striking similarity to analogous images in the Caucasus and the steppes Azov, given the undoubted chronological priority of the first. It is hardly feasible based on materials of only one grave. Rather, it points to a developed channel of communication at this time between the steppe society and tribes of primeval Europe, and, possibly, to direct migrations of the steppe population to vast and fertile plains of Europe.

Thus, in recent years, a new page was opened in the historiography of ancient wheeled vehicles with numerous finds of real vehicles in the steppe zone of Eurasia. This series of finds allows us further detailing of the concept by V.G. Childe on origin and spread of ancient Sumer wheel carriages to other parts of the Old World. ■

To the problem of an ancestral home of the wheel

A simple answer to the questions «is there or not?», «what's older?» hardly could determine an initial center or the centers of origin of the wheel. The invention is based on a complex of reasons, ranging from concentrated immediate needs of a society to the capacity of the very society to implement it. This historic event cannot be «divorced» from the previous period, when ancient societies applied other technological solutions to the problem of transporting of loads too heavy for one person. Another aspect of the problem is an absolute dating of the European and Near Eastern artifacts and their synchronization.

The dating system of European monuments is based on a large series of radiocarbon dates obtained in recent years, while the Sumerian discoveries were found, mainly at the beginning of last century, when the radiocarbon method was not in use. The entire chronology of the Middle East is relative, because it is based on specific dates of known historical events, reign of the royal dynasties, established also by the written sources. As a result, there are systems of so-called «long», «medium» and «short» chronology, difference in dating by each of them amounts to about 300-500 years. Here I am guided by a «long» and «average» systems, since they are the closest to the calibrated radiocarbon dates of Uruk IV [Cambrige Ancient History, 1971, 1973, 1975; Cronologies in Old World Archaeology, 1965, subject to adjustment tables E. Porada 1970-1977; Littauer, Crouwel 1979, p.2]. Many researchers use the system and the dates of the «short» chronology of [Bikerman, 1975].

Let's compare available radiocarbon dates of the oldest known finds, slabs with pictograms of Uruk IVa, 2815+/-85 years BC and of the third phase of the Bronositsy settlement where the pot with a picture of a cart was found, 2750-2550 BC. All radiocarbon dates shall be corrected against the dendrochronological scale [Klein, Lerman, Damon, Ralph, 1982, p. 103-150], after which we obtain calibrated dates of the objects of our interest: 3580 BC for Uruk IVa and 3530-3310 BC for Bronositsa [Piggott, 1983, p.62-63]. This juxtaposition indicates the Middle East priority and the relative synchronization of the data findings.

If we consider the problem from the standpoint of the genesis and development of the typology of wheeled vehicles, the pictograms of Uruk IVa, as signs of ancient Sumerian letters shall be so only when they become stable as to reflect universal concepts in ancient Sumerian society [see Gelb, 1982, p. 34-78]. Because of this circumstance only, the attempts to exclude uruk pictograms from among the earliest evidence of wheeled vehicles seem to be at least strange. [Nikolayev, Safronov, 1983, p. 48, Safronov, 1989, p. 155-179]. With regard to Neolithic monuments in Europe, there was not yet any convincing evidence on «prehistory» of wheeled vehicles. The exceptions are two finds of clay models of slays in the Tripoli culture monuments of the beginning or middle of 3rd millennium BC [Hancar, 1955, pl. 2].

A crucial significance in the problem of ancestral home of the wheel has a comparison of findings from regions where re-

mains of the actual vehicles were found in the graves, along with other sources, images of vehicles and their models. These regions include Sumer and Elam, the Transcaucasia and a steppe zone of Pre-Caucasus mutually adjacent to each other geographically. It seems that the ancient Maikop culture antiquities permit to interconnect all findings of wheeled vehicles in these areas.

Materials of the remarkable Maikop culture are in the focus of researchers already almost a hundred years and regularly cause heated debates about its origins and ethnic attribution of its natives [CA, 1990, N4, p.106-158]. A simple juxtaposition of archaeological materials and the individual words from ancient languages cannot serve as a proof of ethnic and linguistic kinship. Compared between each other should be overall structures of individual historical phenomena [Andreev, 1990, p. 122-125]. Therefore, the problem of ethnic attribution of the Maikop culture natives cannot be solved today only by traditional archaeological methods. This statement does not reject hypothetical attributions, but they should always be verified from the standpoint of the general historical and cultural situation, reconstructed as a result of a comprehensive analysis of various sources: archaeological, written, anthropological, modeling of the relationship of ancient societies.

However, most researchers firmly believe in that the Maikop culture was formed under direct influence of the Middle East impulses. There is similarity of the Maikop ceramics with tableware of Northern Mesopotamia [Munchaev, 1975, p. 375], Tepe Gavra [Trifonov, 1987, p. 20], Tel Hueyra [Nikolaeva, Safronov, 1982, Safronov, 1982, 1983, 1989]. The artistic style of the Maikop cups is similar to traditions of zoomorphic naturalism of ancient Sumer [Andreev, 1977, 1979], and golden faceted beads (Chegem, mound 5, grave 3) find direct analogies in the tombs of the royal necropolis of Ur and are absent in much later Sumerian monuments of Sargon of Akkad times [Korenevsky, 1981]. It is assumed a direct migration of the Maikop culture natives from the territory of the ancient Near East [Gimbutas, 1970, p. 155-197, 1978, p. 277-338, Safronov, 1989].

Let's consider the last hypothesis from the point of view of the evolution of the earliest wheeled vehicles. There are two clay models in the Tel Hueira collection of finds, dated stratigraphically by researchers of the monument to the period EDII [Littauer, Crouwel, 1979, p.16, footnote]. One of them is a decorated van, the other is a lightweight gig pulled by a pair of equines. Remains of exactly these two types of vehicles were found in steppe graves of the Pre-Caucasus, and the van was in the grave, attributed by the accompanying material to the Maikop culture (Pavlograd 4/18). It is noteworthy that mat and felt covers of the steppe vans bear lines and geometric ornaments painted with ochre. Suppose, the migration of the Maikop culture natives occurred from the northern regions of the ancient Near East, then the primary means of such a move, the van, a mobile home on wheels, was known to them.

In the literature emphasized was similarity of the Maikop cylinder seal from the grave near Krasnogvardeisk to the Middle East finds of the pre-Dynastic period [Nekhayev, 1984, p. 69-79, 1985, p. 59-60, 1987, p. 22-24]. On the base of stylistic differences in depiction of figures of a mountain goat or a deer, attempts were made to challenge their similarity [Safronov, 1989, p. 251, fig. 73-74]. This ignores the fact that in all the examined analogies the animal is shown next to the «tree of life.» This image is widely spread in glyptics and arts of ancient Sumer and Akkad [Komorotsi, 1981, p. 47-52]. In the ornamental decora-

tion of the Bronositsy vessel, a cart is placed next to the «tree of life» and the image of a mountain goat is similar, if not identical, to the image of a vehicle in the mythological representations. The subject of «an animal or horses at the world tree» is often found in the petroglyphs of Asia.

It is difficult to explain such a wide geographical spread of this subject only by convergent development, or to assume its penetration from Europe. For understanding the dating of the Maikop antiquities, of fundamental importance is the idea that the treasures, buried in the tomb of the Great Maikop barrow, could be lasting tribal symbols and were not manufactured during the life of a high-ranking person buried here [Korenevsky, 1990, p.127]. These highly artistic traditional items may be regarded as the most ancient and «ethnically pure» layer of this culture – undoubtedly associated with the art of ancient Sumer.

Due to the nature of this work, I shall limit myself by the above examples, but also they do not let agreeing with the synchronization line of the Maikop antiquities by the findings of ED III period in the ancient Near East in its «short» interpretation and dating to 24-23 cent. BC [Safronov, 1989, p. 242-258]. It is more correct to use the «long» chronology. Analogies of the Protowritting and the ED I-II periods, as well as similarity of artistic silver vessels to the ancient Shumerian pictorial tradition convince us with dating of the Maikop culture to the end of 4th – the beginning of 3rd millennium BC [Andreeva, 1977, 1979; Markovin, 1990, p. 106-122; Gay, 1991] or earlier [Korenevsky, 2011].

Outside nature of the Maikop culture is substantiated, on one hand, by the lack of its genetic roots in the Pre-Caucasus steppes, by similarity with ceramic complexes from the monuments of northern Mesopotamia and Syria, by presence of Early Shumerian pictorial tradition on religious, traditional items, and, on the other hand, by the fact of use by the culture natives of mobile homes on wheels – the van – as a means which allowed to fulfil this migration. Military expansion of Sumer and the demographic explosion in the northern Mesopotamia by the end of 4th millennium BC were probably the main factors of this migration. ■

Monuments of the eastern part of Eurasia

There is no definitive data that would allow specifying the process of advancement of pastoral tribes in the Asian part of Eurasia, detrminine its dynamics and mechanism of formation of contact zones in the foothill and steppe areas. There are two considerations of such a move: as a «jump» (pulse) or continuous migration [Gryaznov, 1956, Markov, 1973, p.109].

Archaeological monuments in the Ural-Kazakhstan steppes record the fact of such movement and development of the contact zone in Southern Siberia, Altai and Mongolia. Origin of the Afanasievo culture was directly associated with the relocation of part of the Pit's tribes to Siberia and the Altai [Kiselev, 1951; Alekseev, 1961, p. 380-384; Vadetskaya, 1986, p. 22; Semenov, 1987, p.18].

Findings in the Orenburg region [Fedorova-Davydova, 1971] and in burial grounds of Upper Alabuga and Ubagan allowed to pose a question on extending the eastern boundary of the ancient Pit's cultural-historical area up to the river Tobol [Potemkina, 1985, p. 276].

The far eastern point of the spread of the ancient Pit's monuments is now determined by the finds from the Karagash burial ground in Central Kazakhstan. Excavated here was a stone-earthen mound 30 m in diameter and 1 m high. Under the skirt of the mound, one of the tombs was intact and represented a deep (more than 1 meter) stone box, covered with slabs. The buried was laying on his back, bent legs fell down sideways. In the bed head, a bronze four-sided awl and a «flame-shaped» knife were laid. On the right side of his belt attached with, apparently, a rope was a ceramic egg-shaped pot with a direct low rim, ornamented around the body by finger pinches. On the left side of his belt, traces of a wooden bowl were left. The burial tomb was surrounded by remains of burial fires. The bones were powdered with ochre and charcoal [Evdokimov, Lohman, 1989, p. 34-46].

The rationale of genetic relationship between natives of the Pit's and the Afanasievo cultures found a striking confirmation in the anthropological materials. Their significant similarity is now established [Debets, 1948, Alekseev, 1961]. Besides, anthropologists noted the formation of the Central Asian brachycephalic process centre in the Minusinsk Basin, in the Altai and Tuva, and also a significant similarity between the Afanasievo and the Okunevo skulls. Brachicranial skulls are noted with the population of the Lower Volga region and in the Tripoli-Cucuteni culture [Alekseev, Gokhman, Tumen, 1987, p. 228, see: Shevchenko, 1984, p. 119]. The Okunevo skulls are most analogous to anthropological materials from burials of the Bronze Age in southwest Tajikistan (Early Tulhar), which relate to both a broad-faced protoeuropeoid type population of the Eurasian steppe zone and to the southern protomediterranian racial type, although with unusually high face. This feature is an exact analogy to materials from the Sialk graves (Iran), the Samtavr burial ground (Georgia) and the Ginchi burial ground (Dagestan) [Mandelstam, 1968, p 182, see the definition of T. Kiyatkina – p. 168-182].

Fig. 84. Minusinsk Basin. Stele of the village Znamenka. Drawing.

The area of the Afanasievo monuments is constituted of areas of Southern Siberia, Altai [Kiselev, 1950; Vadetskaya, 1986], west and northwest Mongolia [Novgorodova, 1989, p. 78-89]. The Mongolian monuments are low mounds with stone works and burials in ground pits, the «flexed» corpses laid on the back or sideways, heading to east or west. Skeletons are densely covered with ochre. Anthropological definitions of the buried reveal a great similarity to craniological series of the Afanasievo culture of Altai and the Minusinsk Basin [Mamonov, 1979, p. 205]. The Mongolian findings related to the Afanasievo culture include: rods with zoomorphic sculpture tops, fragments of pottery, ornaments, and flint tools [Novgorodova, 1989, p. 87-88].

The ancient petroglyphs of the Chuluut river valley in Northern Mongolia were dated to the Eneolithic (Afanasievo) time. These are subjects with anthropomorphic creatures, whose hands and fingers deliberately put apart, massive bulls and female ancestors [Novgorodova, 1989, p. 89 et seq.].

The lower date of the Afanasievo monuments in Gorny Altai is within the end of the 4th – beginning of 3rd millennia BC, and the upper date has not yet clarified. Y.F. Kiryushin suggested that this culture existed until the early Scythian time [Kiryushin, 1985, p. 47], according to S. Tsyb, until 1st quarter of 2nd millennium BC [Tsyb, 1984, p. 13, 18], and according to the E.B. Vadetskaya, until the mid-fourth

quarter of 3 millennium BC [Vadetskaya, 1979, p. 98-100]. S. Tsyb substantiated the hypothesis according to which the so-called Altai variant of the Afanasievo culture of southern Siberia – an independent archeological and cultural unit of the Early Bronze Age – emerged as a result of resettling of part of early livestock-breeding East European steppe tribes, natives of the synchronous ancient Pit's culture [Tsyb, 1980, p. 38-51; Tsyb, 1984, p. 12-18]. He identified two chronological groups of the Afanasievo monuments in Altai: end of 4th – the first and second quarters of 3 millennium BC – the first quarter of 2nd millennium BC, which by stages are close to cultures of other regions: Eastern Europe, Central Asia, Kazakhstan, Upper Ob and the Baikal region. Noting the early appearance of metal objects with Afanasievo tribes of Gorny Altai, S. Tsyb explains this fact by «dispersion of the Afanasevo population in direct vicinity of copper and polymetallic deposits of the mineral-rich Altai» [Tsyb, 1984, p. 15].

To the most striking monuments of Southern Siberia belong numerous anthropomorphic stelae, which usually combine female face (?) sculptures on stele butts and a variety of petroglyphs on stele sides. Sometimes these are just stone slabs with various images, but almost always present are carved radiating faces, with «antennas», or incomprehensible appendages [Vadetskaya, Leontiev, Maksimenko, 1980, p. 123-147]. Pictures of vehicles also occur on these sculptures.

A slab from the Znamenka village (Fig. 84). Accidentally discovered in 1899 by a peasant who, digging out a cellar, came across a tomb, covered on three sides and on top with stone slabs. There were 70 bronze beads, pot, bronze bracelets and a knife in the grave. The buried body was laid with his head to west. The found objects were not preserved. The ovelapping

Fig. 85. Minusinsk Basin. Images of carts on the steles and stone walls of tombs-boxes. 1 – Ust-Byur cemetery, fence 5, grave 1; 2 – stella from the village Askiz; 3 – from the valley Uibat; 4 – North bank of river Varcha I; 5 – Hara-Haia cemetery. [Leont'ev, 1980; Kyzlasov, 1986; Filipova, 1992, p. 63].

slab had engravings and became an object of several publications [Gryaznov, Schneider 1929, Gryaznov, 1960, p. 85-89; Leontief 1970, p. 265-270, and others].

Currently, the stele is kept in the Krasnoyarsk regional museum; it is split into two parts, its narrow edge bears a female face (?) and a variety of shapes, pecked in dots on the right side of the slab. The left side is destroyed. Faces and petroglyphs were carved in different times. Initially, it was a stone sculpture typical to Khakassian steppes, with three eyes, ears of beasts, incomprehensible appendixes, solar signs, and hardly-distinguishable details. Petroglyphs are carved in solid silhouette and represent two figures of bulls, one of which overlaps the solar sign and an uncertain animal. One can see an image of an ibex, an anthropomorphic figure and undefined animals. There are engravings of a van and two oxen at the bottom of the surface made in contour lines (6.6.Zn1.).

Tracings by EA Miklashevich has revealed new details on this surface, namely, a figure of a seated man in a vehicle and special notches on wheels similar to those shown on the Askiz gig.

This very finding, to my view, suggests that a van pulled by bulls played a tremendous role in lives of ancient population of Southern Siberia and of the whole steppe Eurasia. An important detail of the image is a charioteer sitting inside the van, which correlates with a particular structural detail of the oldest surviving vehicles, a special seat platform. Recently, this series was added new conditional images of «a driver sitting on a wheel» [Devlet, Devlet, 2004, s. 237-246, abb.1].

Askiz mound (Fig. 85:2). A slab with a gig picture on the front plane edge was in use as a corner stone of the fence of the Tagar time mound, detected by GA Maksimenkov in 1973, stored in the Minusinsk museum. The gig is shown «in profile»; a disk wheel with notches and can be defined as a crossbar wheel (6.6.A1). [Leont'ev, 1980, 68]. The body of the Askiz gig is decorated with carved lines, which reminds peculiar decorations of the clay vehicle models of Tel Hueyra and Tepe Havra.

Mound at Ust-Byur (Fig. 85:1). A large slab with anthropomorphic mask from the Okunev time mound has an engraving of four-wheel carriage, the body of which resembles a boat. (6.6.Ub1). Researchers note the simultaneity of Okunev images of the mask and the vehicle as «connected in subject» [Kyzlasov, Kyzlasov, 1973, p. 223; Leontiev, 1980, p. 68] (6.6.Ub1.). The striking similarity of this vehicle with the Hungarian pot models was already noted.

Razliv X burial ground. The reverse side of the slab with an anthropomorphic mask has an engraved image of an uniaxial vehicle. The burial ground is dated to the Okunev time. [Pshenitsina, 1975, p. 228 Leontiev, 1980, p. 68].

Stele of the Red Rock ulus. A picture of two oxen under a yoke, with draught-pole bifurcated at the end was published. Circumstances of the finding are unclear. [Appelgren-Kivalo 1931, abb. 131; Vadetskaya, Leontiev, Maksimenko, 1980, p. 135, Table. 44]. The above listed images of vehicles are dated to the Okunev time by conditions of their fixation, and upon the stylistic analysis. [Leontief 1980, p. 65-68].

Chernovaya VIII burial ground, mound 5, grave 2. Here, one of the gravestones kept now in the Hermitage, in addition to well-known images of bulls and masks, has two «A»-type gigs. One of them is drawn by a pair of oxen, and the second is partly destroyed: an image of a wheel with four spokes (?)and half of the triangular draught-pole remained. Composition on a slab is multi-layered: the «bony»

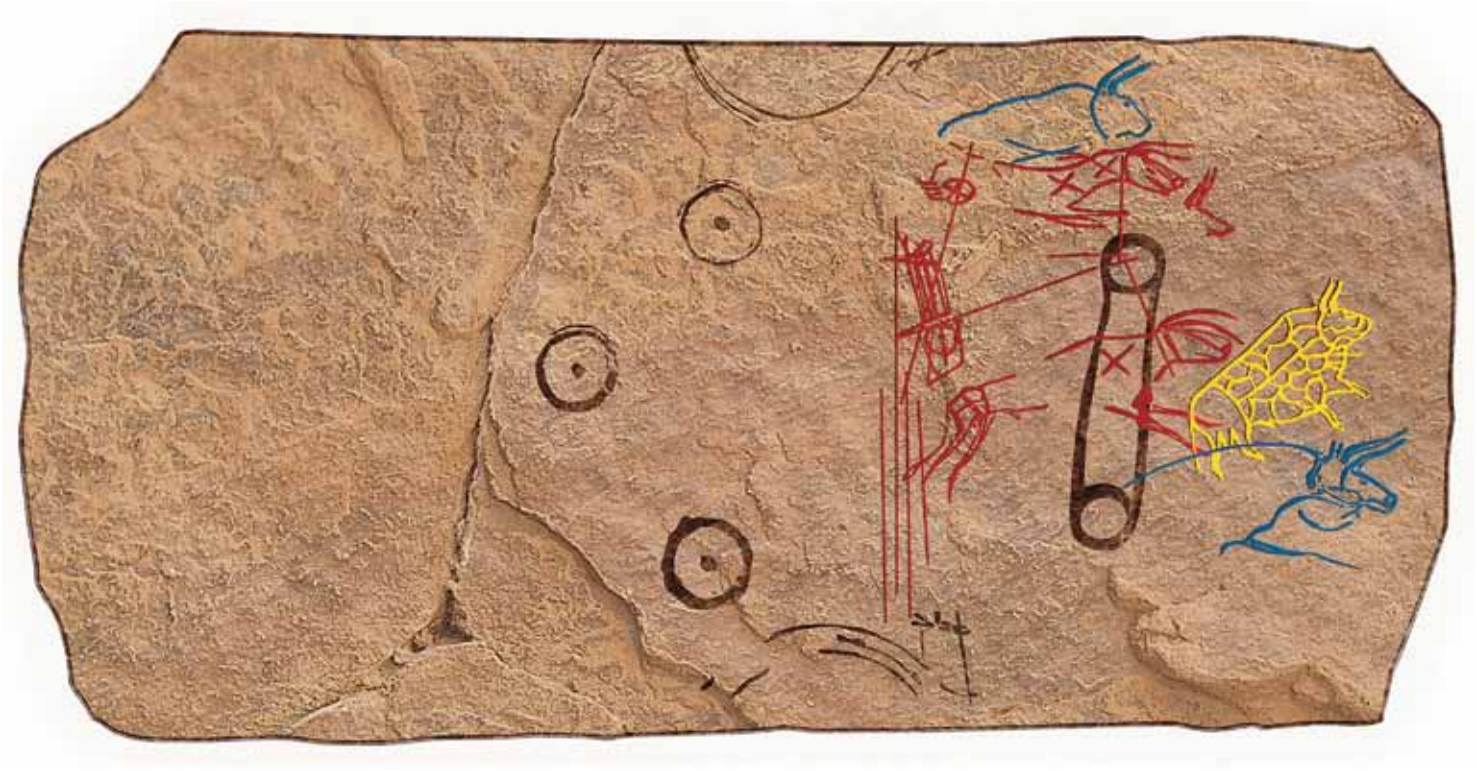


Fig. 85A. Plate of the cemetery Chernovaya VIII. [Sokolova, 2001, p. 129-132, fig. 1]. The visual reconstruction of the original view (collage).

harness bulls overlap the «fat» bulls, one of which, in its turn, overlaps the earlier image of a bull, made in a completely different style. Oxen of the vehicle's harness are overlapped by (or vice versa, the bulls overlap) «the mouth» of masks occupying the entire surface of the slab [Sokolova, 2001, p. 129-132, Figure 1]. A more accurate tracing of the slab is published by Yu.N. Esin [2009].

Dating of the images on the Znamensky sculptures remains discussable. M.P. Gryaznov himself attributed the stele to the Andronovo time and petroglyphs to Karasu, based on dating of the grave, inventory of which may belong both to the Andronovo and the Karasu periods [Gryaznov, 1960, p. 88]. N.V. Leontiev, based on similarities to bull figures on the burial slabs of Chernovaya YIII dated the sculpted figures to the Okunevo time. [Leont'ev, 1970, p. 270].

Many researchers agree with this dating [Devlet, 1982; Vadetskaya, Leontiev, Maksimenko, 1980]. However, stylistic heterogeneity of images of animals on the slabs of the Chernovaya VIII burial ground and some Okunevo sculptures allowed J.A. Sher to raise a question on the «proto-Okunevo» dating of some of these images, including the vehicle [Sher, 1980, p. 170-256], and let L.R.Kyzlasov in Khakassia to single out the so-called «Tazmin» culture [Kyzlasov, 1986].

Defined are two stylistic manners in the portrayal of the bulls on the Znamenskaya stele: massive harness bulls of the van and bony schematic bull figures, which, moreover, overlap the earlier images of a mask and a solar sign.

The only reason for attributing the stelae to «Okunev» is a stylistic resemblance to the images on slabs of Chernovaya VIII

burial ground. The problem of dating and ethno-cultural attribution of these stelae is complicated by the fact that, as a rule, the initial position and the conditions of their discovery in steppes are unknown. Some of these stelae were brought to museums yet in the nineteenth century without any documented data on their origin, some were in secondarily use by later population.

It is the custom of Khakassians to move from place to place these sculptures, which they traditionally worship, depending on changes in migrating routes of livestock [an oral communication Prof. J.Sunchugashev]. In such circumstances, it appears that stylistic similarities cannot be a reliable argument in dating, because similar images of massive bulls are known in petroglyphs of Northern Mongolia in the Chuluut valley [Novogorodova, 1989, p.93, 104, etc.], in Central Kazakhstan in the Baikonur valley [Novozhenov, 1987, 2002] and other parts of Inner Asia, where monuments of Okunevo type are absent.

If we compare the inventory of the Okunevo culture to the materials of the ancient Pit's monuments, one finds a striking similarity in the set of objects and in their typology. The Novotitarov culture is characterized by numerous bone tools and items, and adorations: temple rings, bone plates, pendulums made of canine teeth of animals, «lame-shape» knives, awls, including a set of items for netting or weaving [Gay, 1991, p.63, 66].

However, it is difficult to expect an absolute similarity of utilitarian objects, since by virtue of its practical significance their forms and types change in ancient societies more rapidly in comparison to the ethnic basis. Changes of the latter were seen in the evolution of religious objects, a pictorial tradition and the entire system of religious-mythological concepts.

In this regard, the Okunevo rod with a zoomorphic pommel shall reasonably be compared with similar findings from the ancient Pit's monuments and finds of rods in the north-western Mongolia. The Okunevo «riton», at all, can be compared only with the alabaster cult pots from the temple of the goddess Inanna in Uruk, dated to the beginning of 3rd millennium BC [Margueron, 1965, fig. 94, 96, Dmitrieva, Vinogradova, 1986, p. 99] or with the ritons of the Mycenaean civilization and the metal ritons of the later Achaemenid period in Iran. The fact that these items were traditional tribal symbols of power, emphasizes the conditions of their findings on the monument: in a tomb 21, mound 8, where a man was buried, on the belt of which were a set of indicated cult objects and a skull of Demoiselle Crane (Anthropoides virgo); it is assumed that they were in the sack or a bag [Vadetskaya, Maksimenko, Leontiev, 1980, p. 24].

The ceramic complex of the burial ground strikes by variety of ornaments with domination of only one form of dishes – jars. The ornamentation was created by use of a comb stamp, notches, impressions, imprints of shells. Many pots have a series of parallel grooves on the rim, pearls are attached to one fragment [Vadetskaya et al 1980, p.118, Fig. 14-15, p. 119, fig. 15-19, p. 120, fig. 3-4]. A comparison of this complex with ceramics of the Novotitarov culture reveals significant similarities: all flat-bottomed pots are jars, there are also tiny pots; a dominating ornament is zigzag. Pearls and canellure are applied but later they are replaced by drawn lines. Remarkably, that in the Novotitarov series of ceramics there is a pot with a ledge and the rows of shaded triangles, characteristic to the later Alakul dishware [Gay, 1991, p. 63-64, Fig. 5].

A pictorial tradition is expressed the most vividly on slabs of stone boxes of the Chernovaya VIII burial ground. Found here

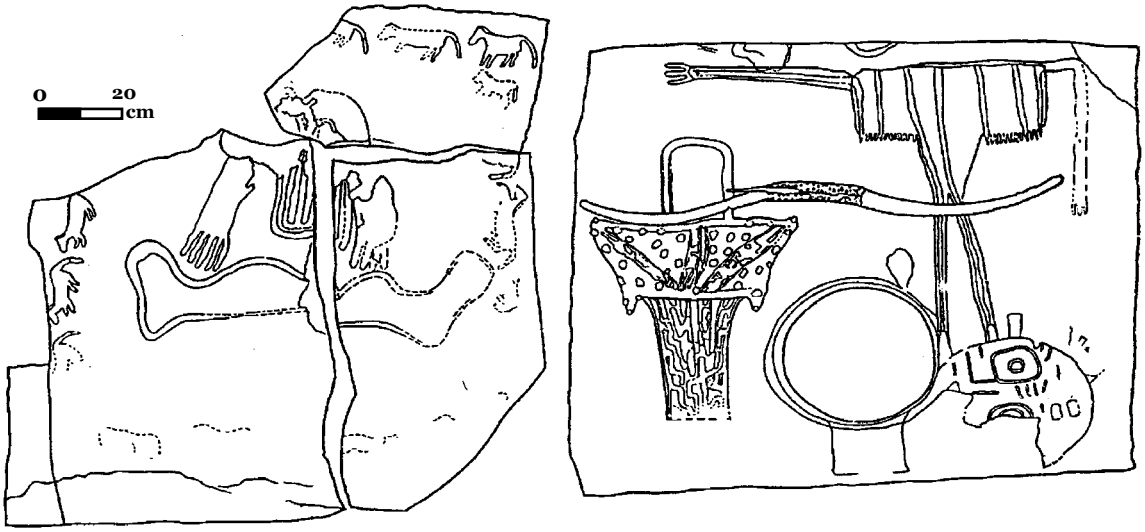


Fig. 86. The cemetery near the village Novosvobodnaya. The painting on the walls of the stone box in a barrow 28. [Rezepkin, 1981, fig. 1].

were slabs containing either single images of animals/masks, or multi-figure compositions that overlap each other. Recorded are: figures of 34 bulls and cows, two figures of dogs, three of a crow, a fragment of an elk head and a dubious figure of a horse. Shown are only the massive figures of bulls and cows, significantly different from the lean bulls from the Razliv X mound. Findings of «A»-shaped gigs, drawn by «bony» bulls, can witness a later time existence of this stratum of images in comparison with their obese counterparts.

Although it is fair to compare the Chernovaya VIII slabs with much older images of masks, the anthropomorphic creatures and birds, both pecked and painted by ochre from the burial ground Tas-Hazaa. This burial ground was identified as Afanasievo [Lipsky, 1961, p. 271], then part of entrance graves was attributed to the Okunev time [Maksimenkov, 1965, p. 40]. Much antiquity of anthropomorphic figures on the Tas-Haza slabs is confirmed by analogy with the figure of a man with fingers spread on the Kernosov idol in the Black Sea, on the walls of Novosvobodnaya tombs (Fig. 86) and with images of anthropomorphic tridactylous creatures in the Chuluut petroglyphs, where these images share same slab with massive bull figures [Novgorodova, 1989, p. 92-93].

If it is so, the Tas-Hazan slabs can serve the Afanasievo attribution of some anthropomorphic sculptures of Southern Siberia inasmuch, as the Chernovaya VIII slabs can justify their relationship with the Okunevo culture.

Taking into account these observations, it appears that the Okunevo monuments are genetically related to Afanasievo and reflect the chronological changes mainly in the material culture survived by first settlers from the western part of the Eurasian steppe [see more info: Sher, 1980, p.216-232].

Pastoralists, who arrived from the west, brought with themselves a tradition to set up menhirs and anthropomorphic sculptures. This idea was further developed locally, as manifested in the style changes, in multiple superpositions, in an evolving image of woman as the family keeper. In the Mongolian steppes, this idea turned into a custom to in-

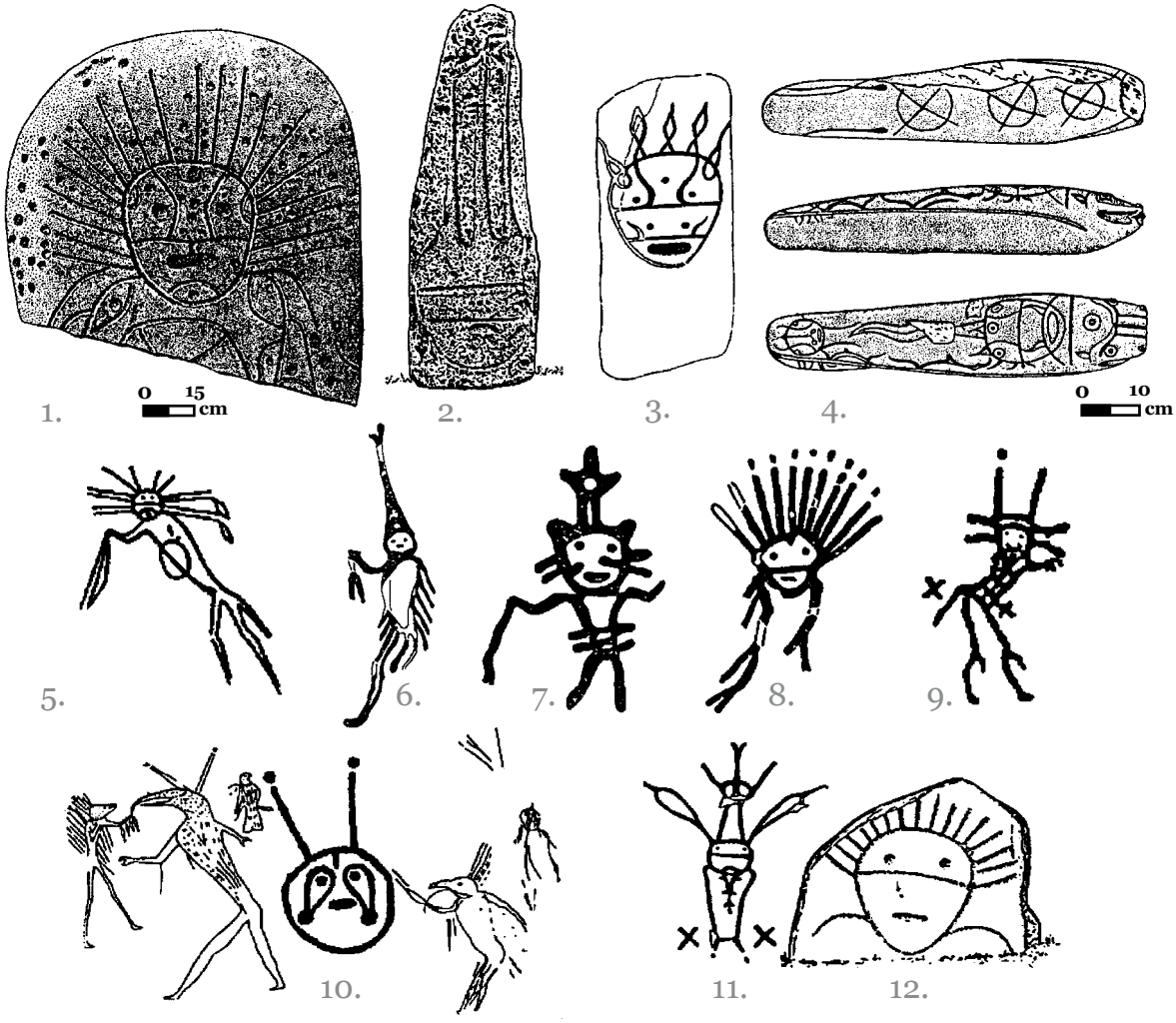


Fig. 87. Images of «sun-headed» on the stelae and the petroglyphs of southern Siberia. 1 – Stella, again used as the cornerstone of the northern Tagar fence in the cemetery at Black Lake; 2 – a staue at the pass of the river Thea valley to the valley of the river Tashtyp; 3 – village Farpus, reused in the Tagar mound; 4 – figurative sculpture in sandstone, found in the Shira region of Khakassia (stored in the Siberean Department of Russian Academy of Sciences, Institute of History); 5 – Tas Hazaa, engraved on the tomb slab 5; 6 – 8 – ocher paintings on rocks Kantegir I and II; 9,11 – rock paintings near the village Bystraya, on the right bank of the Yenisei; 10 – Tas-Hazaa, grave 1; 12 – stele near Ulus Verkhnyi Mayak at Erbe river. [Kyzlasov, 1986].

stall the deer stones. Apparently, there is time discrepancy between installation of stone steles and drawing of pictures on them.

A custom to decorate walls of the stone box and the very megalithic stone ceremony at a mound became an innovation in history of ancient tribes of South Siberia. Initially, images were made by ochre painting (Tas-Hazaa), and then by carving a rock surface.

The most ancient in Central Asia images of vehicles are: vans on the Znamenskaya stele; carts at the Ust-Byur station and gigs on the Askiz stele, dated to the Afanasievo time.

A burial ground was excavated at the Karakol village in Altai; the majority of the graves, stone boxes, was plundered or destroyed. The box walls appeared to have amazing polychrome paintings, the main

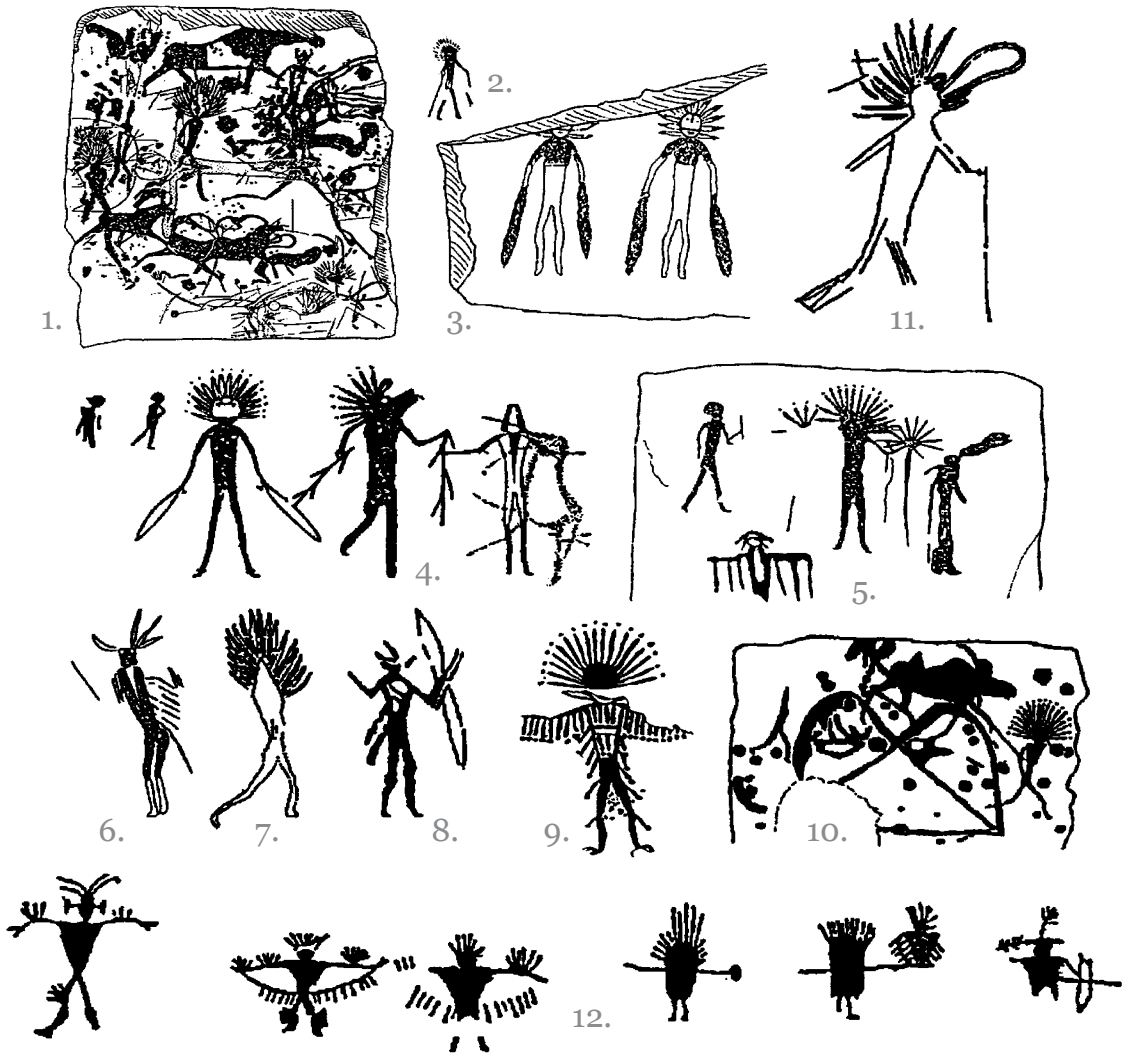


Fig. 88. Images of «sun-headed» creatures on the burial slabs Karakol in the Altai Mountains and China's petroglyphes. 1 – barrow 2, grave 2, plate 3; 2 – barrow 2; grave 2, plate 4; 3 – barrow 2, grave 2, plate 1; 4 – grave 5, plate 1; 5 – grave 5, plate 6; 6 – barrow 2, grave 2, plate 2; 7,11 – barrow 2, grave 2, plate 2 (engraving); 8 – grave 5, plate 4; 9 – barrow 2, grave 2, plate 5; 10 – grave 5, plate 3 [Kubarev, 1988]; 12 – Kanguan, Yunnan Province. [Chen Zhao-fu, 1988].

character of which is an anthropomorphic «sun-head» shown both in plan and in profile [Kubarev, 1988]. The closest analogy to this figure we find in the paintings on stone boxes of the Tas-Haza burial ground, in Chuluut petroglyphs, on tomb walls of the mound 28 of the Novosvobodnaya station [Rezepkin, 1982, p. 28, Fig. 1]. Similar characters are depicted on the Afanasievo (Okunevo) stelae (fig. 86-89). This similarity suggests Afanasievo attribution of the burial ground. Let me note a surprising closeness of «the sunheaded» and anthropomorphic figures on the Kernosov idol, a striking coincidence of colors range (red, black, white paints) and of some figures on stone boxes from the Novosvobodnaya station and Kurban-Bairam, as well as in petroglyphs of the Chinese province of Yunnan.

Fig. 89. Mongolia. 1-7 – images of people and animals in the petroglyphes of valley Chuluut. [Novgorodova, 1984].

When plowing a field near the Ozernoye village, 50-60 km from the Karakol station, a unique slab of gray shale was discovered (Fig. 90). It bears images of 13 animal figures made by pecking in combination with bas-relief elements and carving. Only bulls are clearly determined. The figures are grouped into three horizontal friezes; fine details such as horns, ears and hooves were thoroughly worked out. The authors of publications do not find direct analogies to these images in Central Asia and point out to characteristic similarities with the bas-reliefs of Egypt and the ancient Near East [Molodin, Pogozheva, 1990, p. 167-177]. Interestingly, figures of bulls and goats (?) are similar to images on vessels from the Big Maikop burial mound, to the Early Shumerian pictorial tradition, and also to fine engravings of anthropomorphic figures on slabs of the Tas-Hazaa burial ground.

The Ozernoye slab can serve as a direct evidence of progress of pastoral tribes into the steppe regions of Inner Asia, of their interactions with the ancient civilizations of the Middle East through the Caucasus.

In the eastern part of Kazakhstan, a grotto Akbaur (Fig. 16) was discovered, the walls and the ceiling of which are painted with dark red geometric signs, images of light mobile homes like huts, and an unharnessed gig, in total, over 80 pieces [Sa-

Fig. 90. Gorny Altai. Oziornaya plate. [Molodin, Pogozheva, 1990, c. 170].

mashev, 1990, 2010]. The author dates the carriage by a combination of disc wheels with the yoke features shown (vertical butt) to the beginning of 1st half of 2nd millennium BC. It seems that these images may be dated to the turn of 3rd – 2nd millennia BC.

The above materials and arguments suggest the existence of a transcontinental communication channel of ancient pastoral communities, formed in the latitudinal (east-west) direction, across the continental steppe zone. Roaming eastward in dwelling vans, following their numerous herds in search of new pastures, some cattle-raising groups gradually reached the Minusinsk Basin, which is a natural limit to the Eurasian steppes in the east.

These early settlers brought with them many unusual skills: a pictorial tradition for decorating with ochre the walls of their dwelling vans; a tradition to erect megaliths: stelae-menhirs and stone boxes of their sepulchers – homes in other world; their production skills and their own communication systems [Lazaretov, 2011; Semenov, 1987; Esin, 2010]. Once in a comfortable and quite extensive ecological niche, which is the Minusinsk Basin, they actively engaged in various contacts with sparse aboriginal population, adopting their traditions and some of their customs through own local wives. Further advancement of these groups was possible only southward, to the steppe area of Mongolia and the Xinjiang, through the mountain valleys of Altai. ■

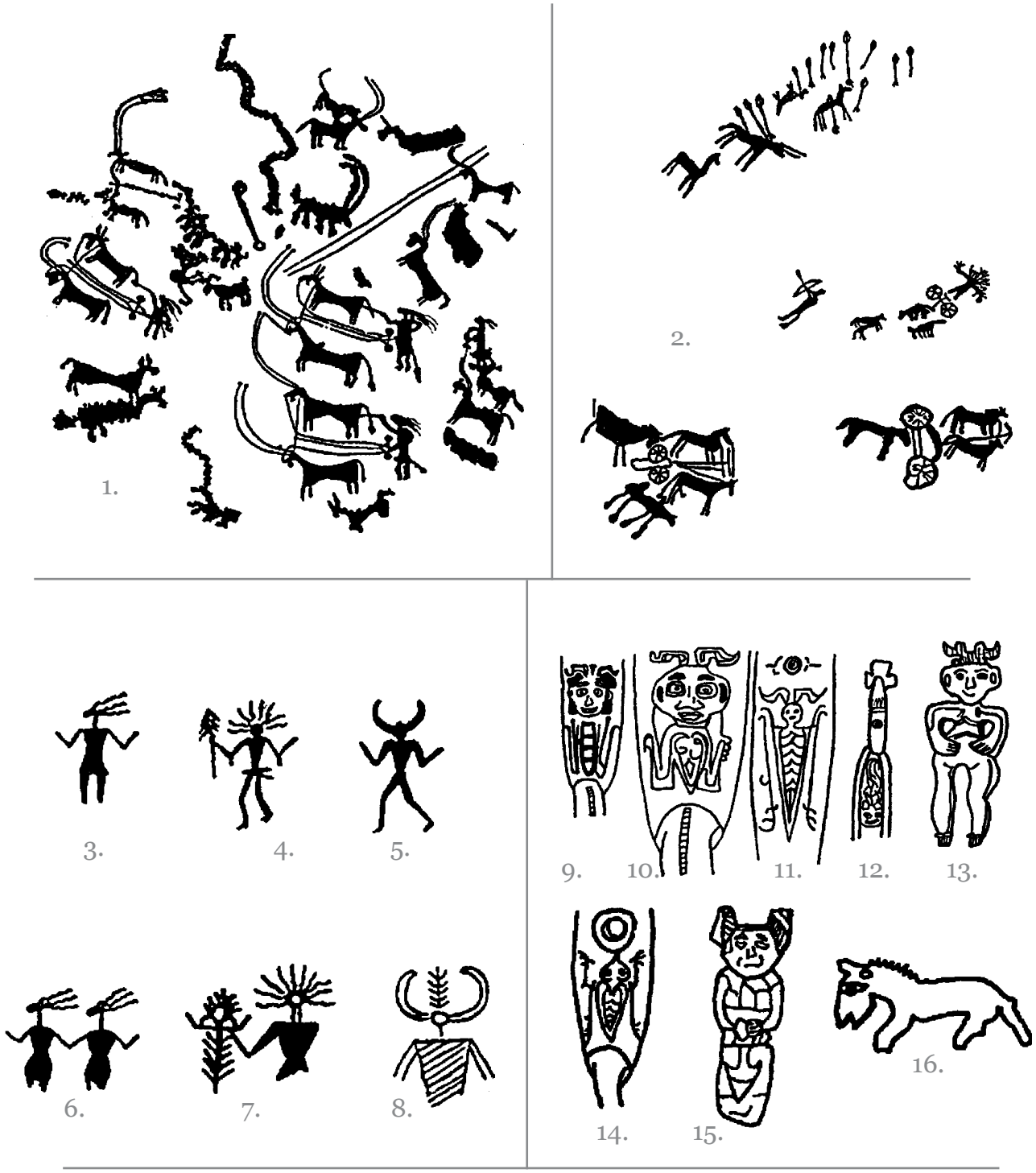


Fig. 91. «Sun-headed» charioteers, Indian and Chinese parallels: 1 – Saimaly Tash; 2 – Eshkiolmes; 3 – Modi; 4, 5 – Bhimbetka; 6 – Harappa; 7 – Navadatodi; 8 – Kalibangan. 3-5 – paintings in the grottoes; 6-8 – images on ceramics; 9-12, 14 – images on the plates of «models of the yoke», Shang and Chzou (14) periods; 13, 15 – Shang and Chzou jade figurines; 16 – jade sculpture of a horse, a similar to graphic signs of Shang's bronze vessels. [Sher, 1980; Mariashev, Rogozhinskiy, 1991; Brooks, Wakankar, 1986; Kozhin, 1988].

Fig. 92. Images of «sun-headed» creatures in the petroglyphs of Central Asia. 1-4, 9-11 – masks of Mugur Sargol, Bronze Age; 5,6 – Tepsey; 7, 8, 12 – Shalabolino; 13 – Karban; 14 – Sosnovka Dzhoyskaya; 15 – Average Lena; 16 – Mugur-Sargol; 17 – Angara; 18 – Samus IV (ceramics); 19 – Tas-Hazaa; 20, 21 – Kamyshta; 22 – Oglahty; 23 – Xinjiang; 24-28 – Baikonur; 29-32 – Tamgaly; 33-34 – Saimaly Tash [Novozhenov, 2002, c. 33].

Reconstruction of migration routes in the 3rd – early 2nd millennium BC

A concept of spread of the wheeled transport from west to east, from the Near East regions into Turan from the south to north, from Central Asian farmers to steppe northern areas, was already expressed in the literature [Ivanov, 1983, p. 36; Gamgrelidze, Ivanov, 1984, p. 950-951]. It is supported by many researchers of petroglyphs [Samashev, 2010; Sher, 1980, Mariashev, Goryachev, 1998, 2002; Slobodzyan, 2003, p. 157-158] because on the Saimaly Tash pass, on an ancient caravan route to the Ferghana Valley, a layer of images of draught animal was recorded: drawings of oxen and mountain goats were performed in bi-triangular style, in profile [Bernstam, 1952; Sher, 1980].

In this style, harness bulls are depicted in two- and four-wheeled vehicles on small disk wheels. Charioteers of these vehicles are depicted with the halo around their heads (Fig. 91:1, 92). ZS Samashev [2010], however, notes that the rock paintings of animals in bitriangular style, which occur together with images of wheeled vehicles, were encountered to the north of the Fergana Range only in Chu-Ili mountains and in small quantities in the petroglyphs Zhetysu Tau. A few copies of these images are known in Tarbagatai, and they seem to be much younger than those of Saimaly Tash and Tamgaly.

It appears that the interaction of steppe culture pastoralists groups with Central Asian agricultural civilization (Turan) is consistent with the third «conjucture» model by K.K. Lamberg-Karlovsky, which is characterized by active contacts in the late 3rd millennium BC between the Indus and the Turanian civilizations. «The expansionist tendencies in Central Asia have focused, on one hand, on the Northern Beludjistan and the Indus civilization, on the other hand, on the areas of Margiana and Bactria. These previously uninhabited areas were first settled by the newcomers, the natives of the Namazga V / VI culture» [Lamberg-Karlovsky, 1990, p. 16-17].

Numerous models of vehicles and their parts were found in the eastern and northeastern parts of the ancient Near East. The finds cannot serve as evidence of widespread use of real vehicles in these societies, but they record the fact of acquaintance with the invention. A model or an image of a vehicle is the most simple way to register the wonderful knowledge on a new facility in ancient societies.

The Gonur Tepe findings of vehicles stand out; their age is synchronous to dating of the Sumer and Elam graves with vehicles. The rapid dissemination of knowledge on a vehicle, or spread of vehicles themselves should be considered in terms of general cultural and historical situation in the ancient Near East during this period [Lamberg-Karlovsky, 1990, p. 3-21].

The period of 3300-2400 BC is characterized by three repetitive situations («conjunctures»).

The first, 3300 BC, is linked to formation of the Sumer city-states and their colonization of the neighboring districts: Habuba in Syria and Godin Tepe, Susa in Iran. These monuments contain cultural layers, similar to the Late Uruk.

The second «conjuncture», approx. 2900 BC, in this period the Sumerian colonization had a significant impact on the Proto-Elam culture of Susa (layers 16-14) and contributed to the expansion of Proto-Elam communities into neighboring areas of the Iranian Plateau: Sialk IV, Tali Malian (period Banesh), Tepe Yahya IVc, Shahr-i-Sohta up to Central Asia, because in the Shahr-Sohta monument, along with the Proto-Elam cylinder seals, ceramic of Namazga III was found. During this period, colonization by the Proto-Elamite from the west is supplemented with the similar expansion from north-east, from southern Turkmenia. I should add that during this period occurred expansion or migration from Mesopotamia of the «Proto-Maikop» population to north, to the steppe regions via the coastal areas of the Caspian Sea.

The third «conjunction», approx. 2400 B,C is the most complex model of interaction of Mesopotamia, the Elamite, the Turan and the Indus Valley civilizations, each of which is actively diffusing its influence on quite distant from each other's territories.

While the relationship between Mesopotamia and Elam at this period was characterized by hostility and rivalry, the Turan and Harappa were actively building their inter-links. Findings of Namazga V-VI were found near Mergarha (Bolan pass into Pakistan), and the Indus Valleyfindings were fixed in northern Afghanistan in the Shortugay settlement [Francfort, 1989].

Contacts between the Mesopotamian and the Indus Valley civilizations (called «Meluhha» in Mesopotamian texts) began during the first conjuncture, with no Sumerian objects found in the Indus Valley and, on the contrary, the Harappian items were known in Sumer. Obviously, the initiative of these contacts belonged to the Indus Valley civilization. No contacts were fixed between Harappa and Elam, who apparently sought to interfere with trade relations between Mesopotamia and Harappa. The latter, by the efforts of Sargon of Akkad, enhances colonization of northern Mesopotamia, Purushhana in Anatolia, and Simurra in Assyria.

At the heart of the historical and cultural interaction is a complex of reasons associated with the formation of new social technology – the bureaucratic state structures, advances in agricultural production and, as a consequence, a very rapid population growth.

Thus, in Sumer was recorded tenfold and later in Suziane threefold increase in population [Adams, 1981, p.70]. From this perspective, the royal funeral ceremony in Ur becomes clear, which required violent killing of large numbers of youth men.

First wheeled vehicles in Sumer, like other early evidence of shaping of state and bureaucratic governing structures, were entirely new and very important tool for the colonization of the neighboring territories. Sources may witness the pronounced military aspect of their application (for example, The Standard of Ur). However, the peculiarity of spread of wheeled vehicles in the ancient Near East is in the settled agricultural character of these emerging civilizations.

Requirements to their use are primarily related with transporting of heavy loads and the harvest from the fields. It is not clear how strong these needs in Turan and Harappa were. Very early emerges an idea of using vehicles as mobile homes, vans. This feature was important for those groups who

had to leave their places due to permanent excess in population and as a result of the military-bureaucratic expansion of Sumer.

It seems that a similar and no less complicated communication system formed in the north, in the steppe zone of Eurasia.

In 3rd millennium BC, Eurasia underwent a global climate change, it became more continental and arid [Dolukhanov, 1984, p. 31; Lozek, 1971], which became the main prerequisite for development of a livestock breeding economy. Arid climate inevitably led to the development of nomadism in the steppe zone of Eurasia, a specific pastoralist culture. In the cultural and historical aspect, this is a vast community of shepherds, united by a common occupation of reproduction of livestock, servicing this process and by a similar system of mythological conceptions.

Features of pastoral economy as per N.Masanov [1984, 1987, p. 29-39, 1989, p. 55-81, 2000, p. 116-130]:

• conventionality, which is conditioned, on one hand, by natural environmental factors, and on the other, by natural biological needs of the herd. Once established, this type of economy remained virtually unchanged for the several next millennia;

• dispersion, the constant mobility of the population, pushed by the need in constant search for new pastures for cattle;

• cyclical movement, which is determined by linking to a specific ecological niche: the sources of water and recovering grasslands after a certain period of time: for example, the Kazakhs in the ethnographic times performed the thousand-km-cycles of migrations;

• Low population density, which is dictated by the number of livestock herds, which requires a large area of pasture, on one hand, and a limited number of people able to feed themselves from the herd, on the other.

• universality, which is derived from the specific conditions of a particular ecological niche and is manifested in a combination of various forms of animal husbandry: the sedentary, semi-nomadic, nomadic and of auxiliary productions, like forging, carpentry, ceramics, weaving and other activities up to farming.

According to archeological data, steppe pastoralists culture is fixed in monuments of ancient Pit's cultural and historical area [Merpert, 1974, 1977, p. 68-79, 1988, p.7-36, Eneolithic of the USSR, 1982], with its many variants, which correlate with specific environmental niches in the steppe and might be connected to the cyclical nature of the animal-breeding economy.

Zones of pastoralist contacts with aboriginal populations are identified. In the western part of Eurasia, these include: alternating co-existence of the ancient Pit's and other Aeneolithic groups in Central and Eastern Europe, marked by V.A. Safronov [1989, p. 203-204], a group of monuments in the steppe Pre-Caucasus: the Novotitarov culture, the Black Sea group of monuments, Starosel'skaya, the Pre-Ural and others.

In the eastern part of the Eurasian steppes, such zones are fixed by findings of the Afanasievo and Okunevo cultures in southern Siberia and Mongolia, the Karakol culture in Altai, the Zamanbaba group of monuments in Central Asia. A necessary link, connecting the western and eastern monuments, was found in Central Kazakhstan. A Pit's mound was excavated in the Karagash burial ground [Evdokimov, Lohman, 1989, p. 34-46]. Materials of the mound correlate with findings in the Trans-Urals and Emba [Potemkina, 1978 s.273].

One of the most important channels of communication in this period is the emerging and developing pictorial tradition.

Sources of the Central Asian pictorial traditions. Let's consider a funeral rite with vehicles from the standpoint of the thesis «a grave is home for the deceased». Two models of this rite can be distinguished.

The first model implies installation of an assembled vehicle directly in a burial pit, or at its edge or in a proto-catacomb (2nd and 3rd stages of the Novotitarov culture, the Maikop tomb Pavlograd 4/18, oth.).

Another model realizes the principle pars pro toto known in ancient times, when parts of a vehicle, most often wheels, are placed flat in the edges (corners) of the grave, or on its ceiling (stage 1 of the Novotitarovnov culture, tombs Arkhara and Tri Brata, oth). An indispensable attribute of graves of this type is a felt cover or mat and the remains of special poles inside the burial pit, which probably reflects an attempt to reconstruct the van design in the pit.

Mats and wooden parts, lying on tomb ceilings, as in the first and second models, are decorated with a zigzag pattern, made with red paint (Lebedy I, Mound 2, Grave 119). Sometimes the patterns have forms of oblique crosses made of white paint, or intersecting bands of red, black, white colors; black edging of mats were also noted (Ostanyi, grave 100, 140, 150, 160, Mound 2, Grave 15, Plastunovskaya I, grave 11). And finally, a subject painting in red paint was found on the ceiling of the grave 11, mound 3, Baturyn II [Gay, 1991, p. 59-60; Sharafutdinova, 1983].

Specialists on Caucasus have no doubts about genetic ties existing between the Novotitarov and the Novosvobodnaya cultures, moreover, there is a tomb with a vehicle of the latter culture [Kondrashov, Rezepkin, 1988]. Assumed is a direct inheritance of the Novosvobodnaya traditions, or the coexistence of two cultures at an early stage of the Novotitarov culture [Gay, 1991, p. 66-67]. V.A.Safronov substantiates in detail similarity of the Novotitarov (Kuban-Dnieper) culture to the ancient Pit's and the Novosvobodnaya monuments [1989, p. 213-241], and unites the dolmens of the Novosvobodnaya with the Usatovo and the Kemi-Oba megalithic structures into a single bloc of cultures.

The last conclusion seems to be very important because it allows a better understanding of the origins of the steppe pictorial tradition.

Mortuary structures of the Novosvobodnaya culture are represented by large stone boxes, ground pits, or pits with wooden boxes. The wall stone of a two-chamber box bore a polychrome painting [Rezepkin, 1987, p. 26-32]of red and black anthropomorphic figures and a string of horses on a white prime coating. Similar paintings, executed in same colors, was found on the wall of a stone box in the Kurban-Bairam, attributed to the Kemi-Oba culture [Schepinsky, 1985, p. 334-335]. The peculiarity of the Kemi-Oba culture, monuments of which are common in the Crimea, Dnieper and the Azov Sea area is in the decoration of stone box walls by different geometric shapes and in setting up stelae over tombs in the form of a simple slab or an anthropomorphic figures.

Thus, the Kernosov Idol is an anthropomorphic stele with engraving of an axe, staff-like items, a knife, a mace and other objects on the face side and a string of horses (?) at its base. The side of the stele contains two human figures, one of which is shown with an exaggerated hand with fingers wide apart.

The traditions of decorating the walls of stone boxes, cover mats and grave walls (Tri Brata) seems to be identical in the cases of the Kemi-Oba, Novosvobodnaya and Novotitarov burial rites.

Use of stone slabs in the graves can be determined by natural and geographical conditions. In the steppes, it is difficult to find a slab of suitable size; transporting it

is not economic, and led to replacement of their functions by available materials: felt or mats, wood, while maintaining the tradition of ornamented painting.

Thus, manufacturing teams of the pastoralist steppe culture were familiar with the pictorial tradition, which manifested itself in decorations of van walls (Bedeni) and burial structures, installation of anthropomorphic steles and menhirs. These were necessary conditions for developing own traditions for portraying vehicles. This tradition stems, apparently, from Middle Eastern roots. Among pastoralists, it was further continued in rock images of the Kamennaya Mogila tomb, in Geghams mountains, on the Zuchen slab and in ornamental decoration of the Bronositsy vessel, which, by the shape, is a direct analogy to the Novosvobodnaya dishes and could come from cattle-herders as a result of exchanges.

My view on the west steppe impulse, which influenced the Central Asian pictorial tradition, cannot exclude or ignore the local Neolithic rock pictorial tradition represented by the monuments of Shishkino, Shalabolino and others in the Siberian taiga. An interesting problem of mutual interpenetration in the steppe and taiga traditions requires a detailed analysis, awaiting its researchers.

Generally, a juxtaposition of a personage of a pictorial tradition with an archaeological culture is hardly appropriate. Rather, this character should be brought into correlation with a certain local pictorial tradition, and if there are arguments, then also with an ethnic group expressed by the tradition. Such terms as «the Afanasievo art,» «the Okunevo art», «the Andronovo art « in a sense are conventional and are working concepts of archeology.

Profile and plan projections. The Middle Eastern pictorial tradition knows only one perspective, imaging of vehicles and draught animals in profile. In petroglyphs of the Kamennaya Mogila, harnessed bulls and a vehicle platform were pictured in plan, and the wheels as short straight lines. On the Bronositsy vessel, on the Zuchen slab and in Geghams Mountains' petroglyphs, draught animals are shown in plan, and the wheels are depicted as circles, as if laid flat. This, obviously, relates to the second model of the steppe burial rite with vehicles, when wheels in corners of a tomb symbolized a vehicle, the body of which was the burial pit itself, a prototype of a wheeled home. Perhaps, this stable mythological representation is the basis of the plan projection in the pictorial tradition, and a tent van means the very burial pit.

The tomb slab images of the Novosvobodnaya, the Kemi–Oba cultures and the Baturyn II mat indicate the use of profile figures. It seems that the choice of the angle for vehicle images depended solely on an artist's desire to show only those parts of a depicted object which are of interest to him: a wheel, or bodywork. The first model of the steppe burial rite perhaps correlates with the idea on a vehicle in profile, when a cart is installed assembled, visible from all sides.

Pictorial sources are witnessing the wide spread of the «A»-shaped type vehicles and gigs on small wheels in mutually very distant regions. This may indicate the formation in this period of stable channels of communication between these regions. Most likely, pastoralists groups periodically «squeezed out» from Mesopotamia were forced to engage in animal husbandry, to seek new pastures for their herds in both latitudinal directions, east and west. Part of these societies were mastering the plains of Europe, finding there the most comfortable ecological niches and forming own internal and external communication channels with the indigenous population. The gradient

of these channels is turned at this time to Scandinavia and the Mediterranean, where the fact of their presence was recorded on the local rocks.

Judging by the pictorial monuments of Turan, the inhabitant groups had a similar structure of mythological concepts. Researchers of synchronous monuments in Pakistan and Afghanistan note the penetration of the steppe tribes from the north, as illustrated by the petroglyphs of the Indus Valley [Jettmar, 1980, s.185-221; 1980a, s.151-199, 1982, s.293-308; Dani, 1983].

H.-P. Frankfor, comparing the copper stamps and amulets from Bactria and Ordos, came to the conclusion that there is no active contacts in the latitudinal direction between the populations of these two areas, while recognizing the existence of a contact between the steppe societies and the ancient farmers along the north–south line [1989, . 203-217].

In steppes of southern Siberia, Altai and western Mongolia, under influence of infiltrating pastoralists groups from the west, a single cultural-historical community was formed, natives of which were close by anthropological type, material culture, and probably had a single unified system of religious and mythological concepts, which manifested itself in the formation of a bright layer in the Central Asian rock art.

It is difficult to specify now the path of advancement of the ancient Pit's groups southward across the boundless steppes of Kazakhstan in Central Asia. I do not exclude a possibility of the movement from south to north too; anyway, such a move is documented by monuments of the Zamanbaba group in the lower Zarafshan course (Kyzyl Kum) [Kuzmina, 1958; Gulyamov, Islam, Askarov, 1966].

Mastering of southern steppe regions by the ancient Pit's tribes might be recorded in the pictorial monuments. Thus, in central Kazakhstan the grotto Tesiktas was discovered, the vault of which contains red paint geometric signs and figures of two massive bulls (Fig.93). The style totally coincides with the interpretation of similar figures on the Chernovaya VIII slabs and in the Aeneolithic petroglyphs of the Chuluut valley [Novozhenov, 1987, p. 68-78, 2002].

Such a wide distribution of similar types of monuments across the Eurasian steppe belt can be explained by the early emergence of nomadism as a main type of economy already in the beginning of 3rd millennium BC [Merpert, 1968, p.41-43, Shilov, 1975, p.5-15].

A.Toynbee dated the start of nomadism to the end of 4th – beginning of 3rd millennium BC [1934, p.404]. It is hard to agree with the idea that transition to nomadic pastoralism occurred only at the turn of 2nd-1st millennia BC [Khazanov, 1973, p. 5-10, Gryaznov, 1955, 1956.1957, Markov, 1973, p. 109]; in this period, the nomadic herding, apparently, occupied a determining place in life of the steppe societies and acquired, Masanov notes, a universal character.

Monuments of this culture, for the first time identified by V.A.Gorodtsov, were defined as the ancient Pit's monuments by a main element of its funeral rite: burial in a ground pit. Later, these monuments received another name «Kurgan culture» [Gimbutas, 1970] for the typical funeral structure. It seems that these terms, describing the funeral rites, should be added a definition «of a van» because a van, or a demountable dwelling, installed or transported on carts, is the main type of dwelling of this culture natives.

Few settlements of the ancient Pit's cultural and historical area, perhaps, were points of exchange, artisanal centers of mobile groups of pastoralists. Large settlements, such as Liventsovka on Don or the

Fig. 93. Kazakh Melkosopochnik. Groth Tesiktas. Bulls paintings. The visual reconstruction of the original view (collage).

fortified type of Mikhailovka or Skelya Kamenolomnya in the Lower Dnieper, are rather exceptions and performed the function of exchange and trade centers, as well as of shelters in the winter period.

Sociobiological factor. Let us consider in detail a manufacturing cell of pastoralist communities, using materials of the Novotitarov culture [Gay, 1991, p. 54-71, 2000]. Among the 500 investigated graves, vehicles were present in 90 cases and only in adult burials (over 20 years). Such burials constitute a quarter of all adult graves, or up to 40% in selected groups of monuments. Same 500 graves relate to one grave of a caster-smith, two graves of carpenters (probable builders of vehicles), and to three graves with sets of tools, presumably associated with weaving and net-making business.

A.N.Gay especially emphasizes that «individuation of a special military class was not noted, there is no explicit burials of leaders, even more so, of military leaders,» [Gay, 1991, p. 66].

A single-time size of this group can be calculated as follows: the duration of the existence of the Novotitarov culture lasted for about 500 years (100 graves per century). With an average life span of 25 years, the approximate number of members of the group is 25 people; although the chil-

dren's graves make up to 17-37% in different groups of monuments, 27% in average. The result is a production team of 18 adults and 7 surviving children in one generation.

This cell was probably a basis of pastoral communities and by size corresponds to a large patriarchal family, which most likely was an autonomous and met own basic needs by their own. Assuming that surrounding pastures get exhausted within a generation [Masanov, 2000, p. 116 – 130], and the cell size was replenished naturally, then the only way of its development is to move on, using a van, to new pastures of either the whole family, or the younger generation of the society. Perhaps only this «model» can explain the tremendous range of monuments of the steppe pastoralist culture.

There is no archaeological data which would suggest social differentiation in the production cells, clans, based on kinship. It is possible to assume a tribal unity of these groups, which had an elder leader, a shaman healer, specialist-carpenters, blacksmiths, and possibly, priest-artists.

Clear evidences of social differentiation appear somewhat later, at the end of the next period, in the form of megalithic structures-mausoleums of the Begazy-Dandybai culture, the Karasu deer stones hereksurs and giant burial mounds of Scythian-Saka time. Although, the tradition of installation of large-scale megaliths with images on them already took place.

A sociobiological factor propelled self-development of these production team-clans. Reasonable to consider each team as a set of two constituent groups: commercial and domestic. The first consisted of adult men and young boys acquiring production skills, the second group of women, children and the elderly. The «mobile» economy keeps the two specializations tightly interconnected. Relations between the two groups were based on a sexual contract, which served three main purposes: nutrition, sex and education. This agreement (sex-status) regulated the internal life within the group and was a base for emergence of moral attitudes, taboos and norms of behavior [Novozhenov Yu.I, 1991, p. 31-46, 2005]. These include a natural tendency to reproduce the family and the desire to prevent incest. The numerous erotic scenes in the petroglyphs show the important role of such an agreement (Fig. 94).

Social status of leaders appearing in the society was largely determined by their physical abilities. On one hand, a need to follow the well-established norms of behavior and morality in every aspect leveled a talented person and led inevitably to stagnation of cultural development of a society as a whole. The obvious traditionalism of nomadic society seem to be a consequence of a fixed system of taboos and various behavioral prescriptions, in a word, a very advanced channel of internal communication of a society. As a result, it became possible to keep only one social structure for thousands of years without significant changes.

Thus, we established that the only way for spreading pastoralists in the steppe is in small production clan teams, separated by great expanses of pasture. Population growth in these groups led to release of kin production groups forced to seek new pastures for own cattle, since certain size of a herd requires a certain amount of biomass proportional to their physiological needs [Fedorovich, 1973; Masanov, 1984; 1989]. Thus, normal reproduction of one individual horse within one year time requires minimum 20 hectares of pasture, reproduction of one individual sheep 12-24 hectares.

Paleodemography factor. Some data from the archaeological monuments of this period may indicate the fact of forcible ritual killing of relatives (or captive slaves) and

Fig. 94. Kazakh Melkosopochnik. Petroglyphs of valley of Baikonur river. Group 1. Erotic scene. The visual reconstruction of the original view (collage).

co-disposal with the buried members of the society. It could be an explanation of skeletons dismembered when alive, found in a Tyagunov grave, and later in the chariot complexes of Sintashta, Arkaim and other monuments. This cruel custom is described in the ancient Chinese written sources, including the fortunetelling bones of the Shang-Yin China. In the following chapters I shall come back to this issue; now I should note that in the period under consideration, with all its irrationality and bonds with the society's developed system of internal communication, it can certainly witness, on one hand, its important ritual and mythological communication semantics, and, on the other hand, the overpopulation and lack of resources for providing «aliens» or for some reason insufficiently active members of their society.

The situation may be specified by paleodemographic reconstructions, which, unfortunately, very rarely appear on pages of archaeological publications [Evdokimov, Povalyaev, 1989, p. 104-110; Evdokimov, 1984, 1994]. It turns out that the entire biomass of a small ecological niche in the basin of the Tobol River, typical for the steppe zone of Eurasia, at one time could not feed more than 500 people, and the population density did not exceed the ratio of less than one person per one square kilometer. These calculations correlate with the indices of population density in Siberia upon ethnographic data.

Further spread of nomads was facilitated by development of more arid, steppe grasslands along the river valleys, or by increase of sheep, horses and camels in the composition of a herd, and this was recorded in the osteological materials from more arid regions of Kazakhstan [Nurumov, Makarov, 1988]. These findings signify that possible migration of steppe societies initially was voluntary and entirely peaceful in nature, resembling more development of virgin lands, and not the process of colonization of a «foreign» territory, with all the horrors of forced assimilation and subjugation of the native population. (Illustrative in this respect seem to be fortified settlements of Sintashta and Arkaim, abandoned by the population at once, without any visible signs of battles, and also Hatussa (Boğazköy), the capital of the Hittite kingdom.) Rather, the advancement process led to the sharp increase in mixed marriages and quite fast change by historical standards in the anthropological type, some innovations in economic skills, which is fixed by a variety of types of pottery decorations, and possibly led to a change in the language of communication, while maintaining and conserving the most archaic and stable features of its own identity.

Although archaeological data allow fixing quite significant events and historical phenomena, changes in social life can be reconstructed only mainly in theory. Two levels of research are applied: historical, reflecting the global processes and changes, and social, which takes into account changes, rooted in the natural biological needs. Changes at these two levels are not always adequate.

Social processes are strongly influenced by random factors, such as diseases, epidemics, marriage and family relations, climate change, etc., which predetermine their considerable mobility. In what degree such «microchanges» may influence global historical processes?

The linguistic factor. In his paper, J. Robb [Robb, 1991, p. 287-291] attempted to answer the question basing on the computer modeling of the historical process as the spread of Indo-European languages in Eurasia [more about this process, see: Mallory, 1989; Renfrew, 1987]. «Microchanges» in the social sphere are considered to be «a kind of social Brownian motion» [Robb 1991, p. 287].

It occured that small in number conventional linguistic groups either moved over long distances on the map of Eurasia, or developed in isolation. At that, the area of «mobile» groups is more stable and continuously growing due to the «colonization» of foreign territories. Isolated groups are more vulnerable and prone to extinction (Fig.95).

The developed model allows us to reconstruct the spread of Indo-European languages in history. Many ancient non-Indo-European languages disappeared, apparently, as a result of this process, while some Indo-European languages were replaced by other languages within the same family. If the initial stages of this process had a random and chaotic character, in the final stages it became accompanied by the awareness of suitability and necessity of conquest and hegemony [Robb, 1991, p. 291].

Lasting isolation of individual production teams caused the imminent danger of degeneration and physical degradation. Therefore, of fundamental importance were marriages and family relationships with the other, considerably distant pastoralists groups and with other societies, including the agricultural ones, which determined the nature of communication channels that were forming here in the 3rd

1.

Fig. 95. Distribution of Indo-European languages in the Eurasian. Model of «stochastic loss of origin»: 1 – initial distribution of language groups.

millennium BC by natives of numerous archaeological cultures of the steppe of Eurasia, between each other, and also it determined originality and orientation of these channels to settled civilizations, existing at the time and possessing values unavailable in the steppe.

No matter how complex and contradictory are the obtained linguistic data, one thing is clear: by the end of the 3rd millennium BC in the Eurasian continent already existed a fairly complex and developed system of different channels of communication between a variety of communities. Obviously, a transcontinental transport corridor was formed in the latitudinal direction linking its European and Asian parts. Two branches of the corridor, north and south, are fixed definitely. The first took place in the plains, steppe and forest-steppe regions of the continent up to the Minusinsk basin and northern regions of China in the east and to the Scandinavian peninsula in the west. The second took place in the south: up to Harappa in the east and to the Mediterranean Maghreb in the west. In the Asian part of the continent, communication channels run along the north-south lines across the territory of Turan. In this period, a variety of patterns of interaction between pastoralists groups and indigenous population were built up in contact zones.

Internal and external communication channels are distinguished, characterized by relationships, mainly, between pastoralists groups, similar ethnically and by language, and less economically developed societies.

This system of relationships, rather, was dominated by marriage and family relationships, natural exchanges, joint ritual (religious) ceremonies, like the bear festival of the northern peoples, or the Indian bacchanalian fertility festivals [Kosambi, 1968], which took place in the sanctuaries with petroglyphs, the original temples under the open sky, in the most important and convenient places, along the routes to new pastures and fertile valleys.

Obviously, by the late 3rd millennium BC, occurred in the steppe environment were the well-known ethnographic processes of assimilation and integration, including non-peaceful relationship of individual

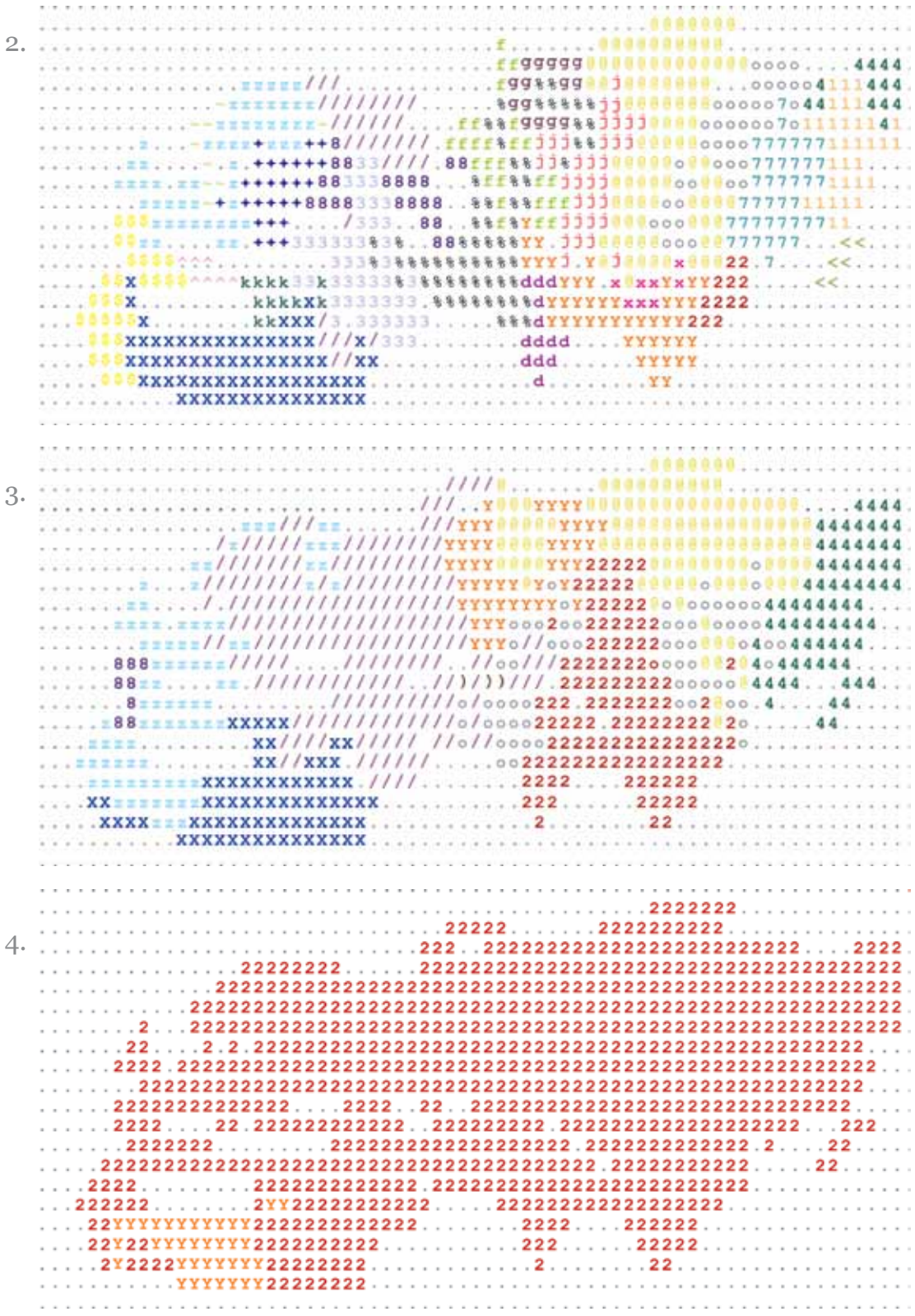


Fig. 95. Distribution of Indo-European languages in the Eurasia. Model of «stochastic loss of origin»: 2 – location of language groups after 60 cycles; 3 – after 340 cycles; 4 – after 2000 cycles [Robb, 1991, p. 291]. The symbols on the map – language groups; the points – the oceans, deserts and mountains; figures – areas in which there is a change of language in a single cycle.

pastoralist groups. Very problematic at the present time is the direct identification of some groups of steppe population, fixed here by many recorded archaeological cultures, with some specific petroglyphs localizations fixed in the area. Rather these are common sanctuaries, belonging to several different clans or groups of societies, united by the same spiritual culture, whose «own» communicative symbols and images are understood. Such a view explains the differences in style in one monument and existing chronological «gaps» that could not last too long.

In general, in 3rd millennium BC, in the western part of the Eurasian steppe a complex system was formed of interactions between individual groups of cattle-raising tribes and settled agricultural local tribes of the forest-steppe and foothill areas, which resulted in emergence of a new archaeological cultures and individual variants of the ancient Pit's cultural-historical area. The development of the latter is associated with specific natural and ecological niches and the cyclical nature of cattle-breeding. This system correlates with the situation, defined by the linguistic data as the Late Indo-Europien linguistic unity [Gamkrelidze, Ivanov, 1984, p. 895-959].

How relate the proposed conclusions with the known concepts of the ancestral home of the ancient Indo-Europeans established on the basis of the linguistic analysis? In full they correspond to a concept according to which the ancestral home is located in Anatolia [Gamkrelidze, Ivanov, 1984].

Some provisions of the «dynamic» concept of localization of the late ancestral homes in the Eastern Europe and in the Balkans could be considered in the part which is devoted to the analysis of the inter-relationship of the ancient Pit's and the Kuban-Dnieper (Novotitarov) groups with local European tribes [Safronov, 1989]. This is not to accept a Semitic attribution of the Maikop culture, its clearly «rejuvenated» dating and the concept of origin of wheeled vehicles in Europe.

The Indo-Aryan attribution of the Kuban-Dnieper (Novotitarov) culture was not yet sufficiently substantiated; however, I do not exclude the penetration of Indo-Aryan and Tocharian groups to the Minusinsk Basin during this period.

Ethnic attribution of the Pit's cultural and historical area is defined as the Indo-Iranian, which is supported by the views that the creators of the Srubnaya and the Andronovo monuments, as well as the Scythians and Saka belong to the Iranian speaking culture [Chlenova, 1980, p. 66-67, 1984, p. 259-268, 1985, p. 119, 1990, p. 150-165; Kuzmina, 1988, p. 333-381; Grantovsky, 1960, p.351-357, 1970, p.359-360, 1977; Abayev, 1965, p.134-135, Barrow, 1976, p.123; Tolstov, 1962, p.59; Bernstam, 1957, p. 18-19; Chernikov, 1960, p. 112; Merpert, 1974, p.14; Litvinsky, 1981, p. 160-162, Salnikov, 1965, p.347, Mandelstam, 1968; Gening, 1977; Pogrebova, 1977, p. 133-140; Berezanskaya, 1982, p. 206-209; Rajewski, 1977].

Cultural and mythological ideas of ancient pastoralists are reflected in the hymns of the Rigveda and the Avesta; especially in their Gathas and Yasnas, where «we find the same direct naive, transparent switching into a religious plan of simple elementary feelings and thoughts of a shepherd, for whom there is no higher benefit than his cattle «[Abayev, 1990, p. 15 et seq.]. ■

Chapter 3

Age of chariots: beginning of the 2nd millennium – end of the 1st millennium BC

This epoch occupies less than two millennia in history of the human civilization but in this period occurred radically changed all pre-existing relationships between the steppe society and the ancient civilizations of the Old World. This period is the most interesting and informative in terms of the emerging channels of communication in the steppes of Eurasia, and it largely determined the historical fate of many peoples who lived before and are living here now.

Invention of a light, handy and quick horse-drawn vehicles made a revolution in military affairs and became such a powerful, «miraculous» innovation for the ancients that it became part of the spiritual culture of almost all peoples who lived here as heroic legends, myths, stories and, of course, this image was given a decent expression in the artistic portrayal of this period. This image was so vivid and expressive, that has long been used in the art of many European and Asian nations, as, indeed, is widely used by many artists today.

It is impossible to imagine the history of the Old World, without striking frescoes with chariots from the Egyptian pharaoh tombs, palace bas-reliefs of the Assyrian kings in Nineveh, depicting the supreme rulers on magnificent chariots during ceremonies in honor of military victories and in hunting moments, without the famous terracotta army of the Chinese Emperor Qin Shi Huang and his great bronze chariots.

However, popularity of this image in the ancient and modern art somehow overshadowed many issues of origin of the chariotry, dissemination of the knowledge about this military, transport and a cult machine, and, most importantly, issues of its real-life use in Eurasian societies. ■

The problem of origin of chariots

A place of origin of chariots was long discussed in the literature. Some researchers believe that a chariot appeared in the Middle East with the Indo-European nomadic steppe tribes [Meyer, 1928, p. 44; Lechler, 1933; Helk, 1969, p. 222; Piggott, 1977; Kuzmina, 2000]. Others believe that the Middle Eastern chariots are the result of local development [Clark, 1941; Littauer, Crouwel, 1979, p. 68-71; Crouwel, 2004, p. 69-86].

Arguments of the latter are reduced to the following: wheels with spokes and intersecting slats are recorded in the very beginning of the 2nd millennium BC, in Anatolia, the south part of Mesopotamia and on Syrian cylinder seals of 18th-17th cc. BC. It was a result of the evolution of previous forms of the wheel and of the whole vehicle design in this region. Oriental finds of vehicles (Lchashen, Sintashta, Sukhaya Saratovka, etc.) are dated not earlier than the middle of 2nd millennium BC.

Opponents to the concept point to the absence of psalii with spikes for effective steering horses in a chariot in the Middle East up to the 15th century BC, while the steppe tribes already widely used cheek-pieces made of bone and horn, hard and painful for horse, in combination with organic bits. They also note the existing Indo-European technical terms in the Middle East texts, for example, in a famous treatise on training horses, written from the groom Kikulli from Bogazkey. However, the Hurri text is written in the 14th century BC, i.e., later than the documented findings of chariots from southern Mesopotamia and Syria.

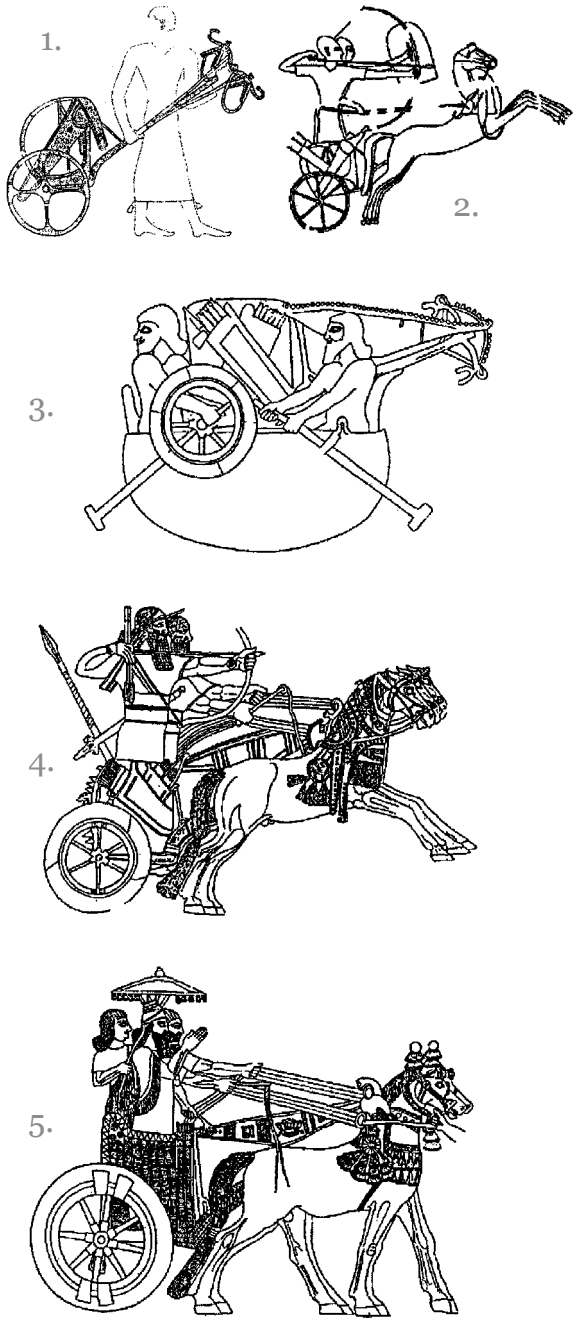


Fig. 96. Near East. 1 – detail of wall painting, Phoebe, the grave of Rekhmir, New York, Metropolitan Museum of Art, N 31.6.34; 2 – detail of stone relief of Ramses III, Mediet Habu; 3 – detail of stone relief Ashshurnasirpala II, Nimrud, London, British Museum, N124543; 4 – detail of stone relief Ashshurnasirpala II, Nimrud, Berlin, Museum of Asia (Pergamon Museum), N 959; 5 – detail of stone relief of Tiglath-Pileser III, Nimrud, London, British Museum, N 118 908. [Littauer, Crouwel, 1979, p. 8-21].

Most Indo-European terms in such texts associated with Hurrites and date to the 2nd half of 2nd millennium BC. In addition, there were local terms for vehicles in the Middle East: in cuneiform Sumerian text GIS.MAR.GID.DA (syllabic writing of «ereqqu») indicated the cargo carts and ox-harnesses; the term GIS.GIGIR (syllabic equivalence «narkabty») defined passenger vehicles drawn by a horse teams and was also used in the military context. It can be applied to chariots as well [Salonen, 1951, p. 45; Kammenhuber, 1961, p. 10, 28; Sasson, 1969, p. 31.170].

Although this debate is far from the end, but now it provided a clear statement that in the area of the Middle East civilization, including the territory of Asia Minor and Turan, the war chariots had two types of spoked wheels and, accordingly, different manufacturing methods (Figure .97).

The first method, Egyptian: wheels with 4 spokes were made of solid wooden parts, joining the halves of spokes with the wheel's nave, glued together. Use of more than 4–6 spokes is ineffective in this design.

The second method is presented in the chariots of Hittites and their Asian allies: solid of one piece wooden grooved nave; rim and spokes were separate details. Spokes were inserted into the grooves of the nave and the rim, and then were fastened by a special tire. Spokes could be between 6 and 28. There were intermediate variants and modifications of each type [Spruytte, 1983, p. 26, 114-120].

In the last decade, new materials appeared from the Eurasian steppe belt, which shed light on the problem, but first let us consider in more detail the arguments pro and contra the two concepts above. ■

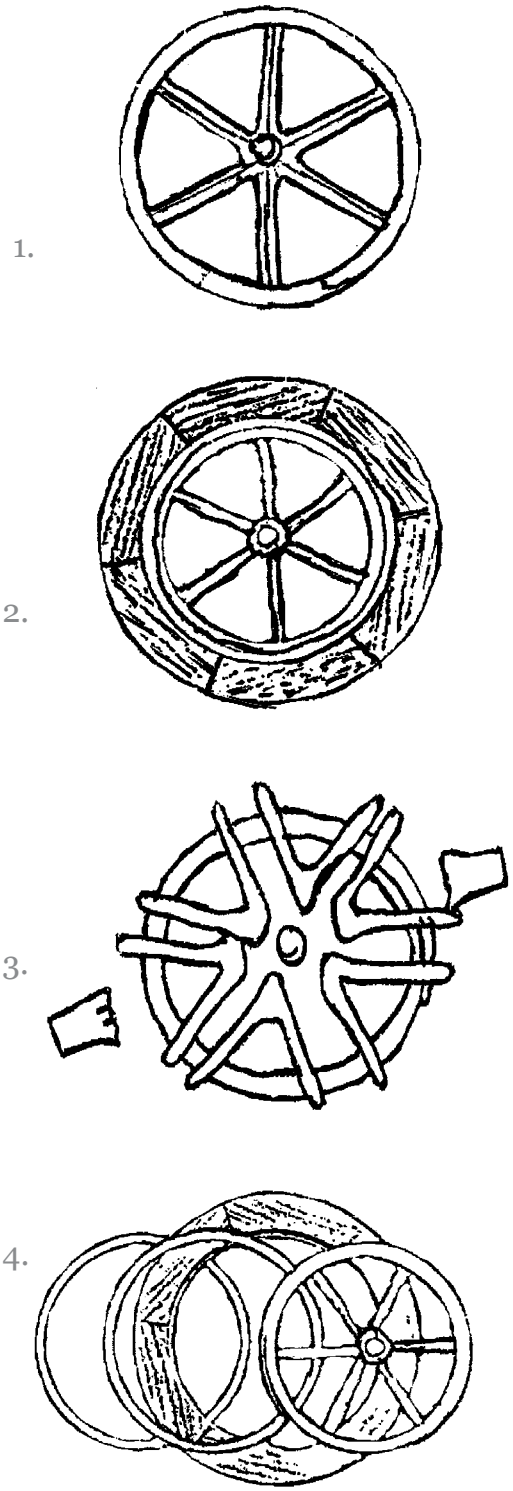


Fig. 97. Two types of wheels manufacturing technology: the Egyptian and Hittite. Models of ancient wheels. Reconstruction.
1, 3 – wheel of Egyptian chariots; 2, 4 – wheel of Assyrian chariots. [Spruytte, 1983].

Chariots of Egypt and Assyria

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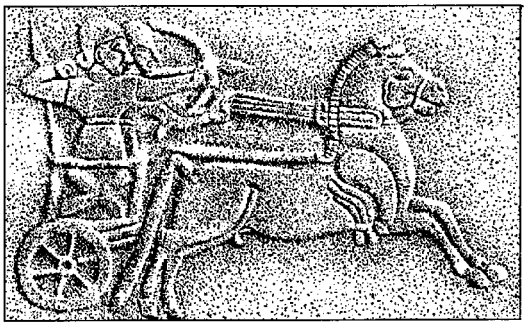

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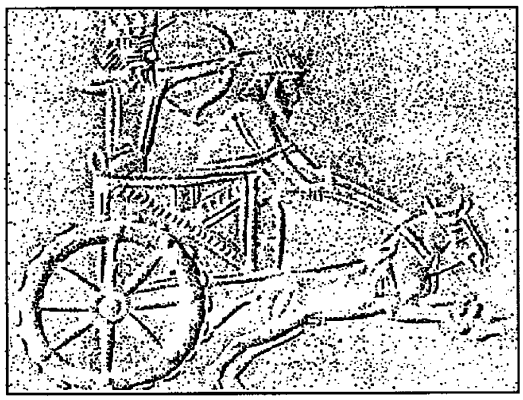

Fig. 98. Near East. 1 – detail of stone relief from the Sakchagozu, Berlin, Museum of Asia, N971; 2 – detail of stone relief, Malatya, Paris, Louvre, AO-255; 3 – press of cylindrical seal, London, British Museum, N 89 132. [Littauer, Crouwel, 1979, p. 8-21].

Chariots of the first half of the 2nd millennium BC are presented by findings from Anatolia [Littauer, Crouwel, 1979, p. 68-71]. They have wheels with spokes or crossbars, drawn by four equines, which, as in the previous period of history, are steered by a rope and a nose ring. Gigs with a sitting charioteer disappear. Two-wheeled vehicles with open platform are widely used, and in this period they turn into war chariots (Fig. 96, 98, 99). Disc wheels are improved; the high front end of the body is replaced by a light fence, the seat for the charioteer is removed. Draught-pole loses its arched curve and becomes slightly bent in the middle. The axis is lengthened, and the distance between the wheels is extended. The crew consists of two people. Draught animals in this period are a pair of horses under a yoke. A yoke-saddle enter in use. The earliest finds of vehicles have wheels with 6, 8 and even 9 spokes.

On the Syrian cylinder seals, chariots are depicted in scenes of hunting with a bow, in cultic scenes, and probably were used as representative carriages.

The earliest images of vehicles drawn by equines, not horses, with spoked wheels, are known in Anatolia, Kanish (Kul Tepe), and its model in Asem Hyuyuk. They date from the first-second quarter of 2nd millennium BC.[Nagel, 1966, Fig. 15 – 17]. In Mesopotamia and Syria, vehicles on spoked wheels appear in the 18-17 cc. BC, but images of horse-drawn war chariots in Asian Near East are not known before the end 17-16 cc. BC [Moorey, 1986, Kuzmina, 1994].

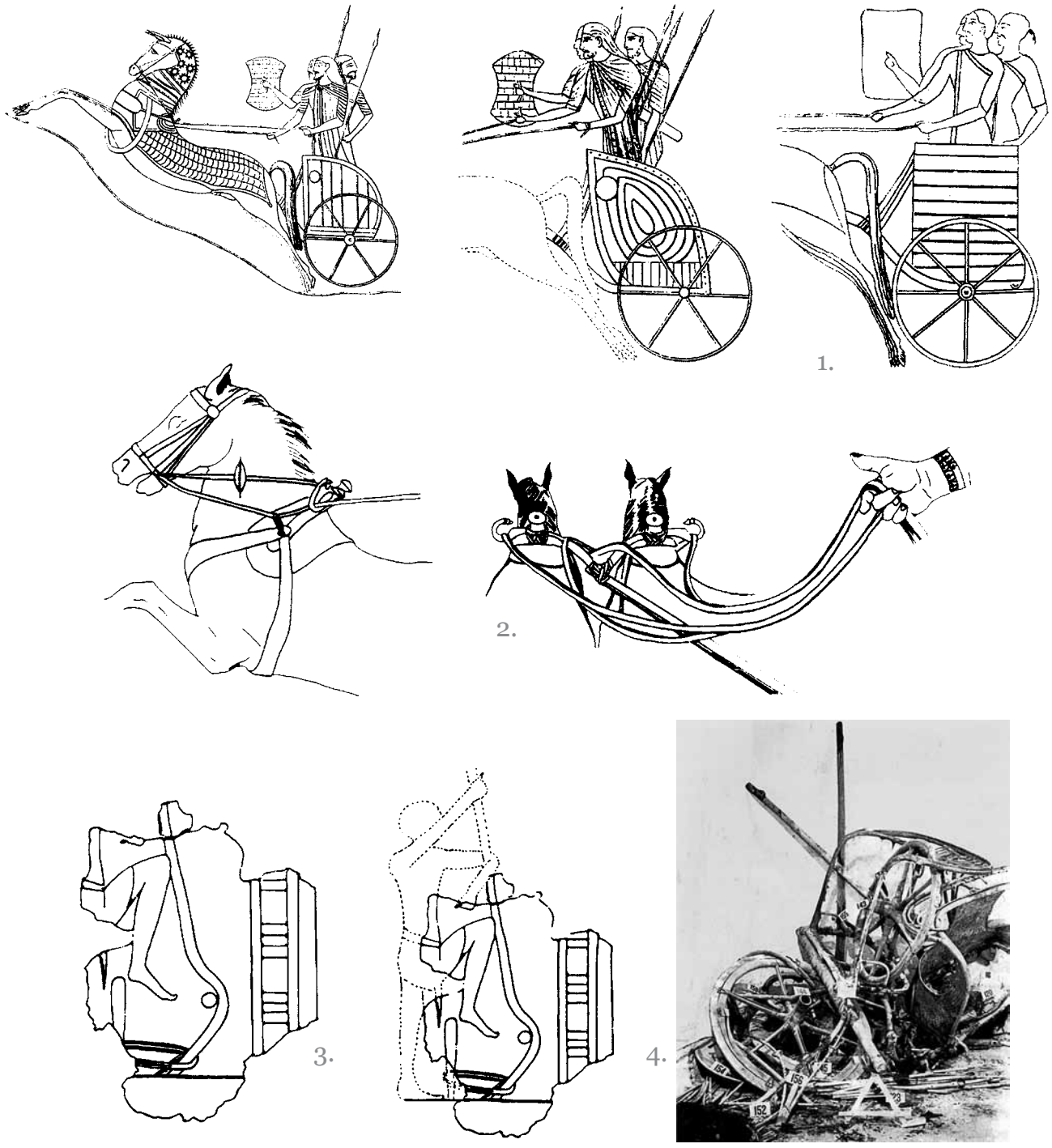

Fig. 99. Ancient Egyptian and Hittite chariots [Herold, 2004, s. 127, 129, 135 – 136 abb. 6, 8, 15, 16]. 1 – Temple of Ramses the Great (1279-1213 BC), tells the story of the Battle of Kadesh; 2 – reconstruction of the ancient Egyptian way of harnessing a horse chariots, 3 – Tomb Intefa (Phoebe, grave 155) the process of manufacturing parts chariots; 4 – burial chamber of Tutankhamun's tomb (1333-1323 BC), dismantled the chariot.

The second half of the 2nd millennium BC is the time of prosperity and dominance of war chariots. Other types of vehicles are also in use: carts, gigs, which becoming much lighter in design. Gigs were pulled by oxen or mules, mainly, in military supply trains.

Chariot drawn by horses, the Middle East were of two types: Egyptian and Hittite. Thus, in the battle at Kadesh between the Egyptian pharaoh Ramses II and the Hittite king Mavatilus, Hittites and their Asian allies positioned more than 2,500 chariots, the Egyptians about 1000. In the battle at Megiddo (beginning of the 15th cc. BC), Thutmose III captured 894 chariots of the enemy; the Pharaoh Amenophis II brought to Egypt as a trophy of two military campaigns in Levant from 730 to 1032 chariots [Helk, 1971 , p. 205; von Shuler, 1965, p. 73].

The Egyptian chariots (Fig. 99) were very stable in turns; the body, open in the back, had a light low sides and enough room for two people. Hittite and Asian chariots were suitable for 3 persons standing behind each other. Egyptian and Hittite chariots had different types of spoked wheels which rotated on fixed axes, placed in the back of the vehicles. Both types had the rims, which consisted of overlapping wooden segments, bent under heat. Tires were made of rawhide or birch bark. Draught-poles had a double shallow bend. The place of fastening a draught-pole to the body was fixed by special wooden braces or straps. During this period, saddle-yokes, adapted to the horses' anatomy, are used to pass the animals' draught power.

Military use of chariots was due to infantry getting disorganized in combat; chariots were mobile platforms for archery. The Egyptian chariots are designed for a charioteer and an archer, while the Hittite three-man chariots were used as a transport on the battlefield. Chariots were also used in the battue hunting and religious ceremonies.

The carts in this period are equipped with different types of wheels, drawn by oxen or mules. Elamite carts had wheels with 12-16 spokes, were pulled by mules or horses and used as a military transport. Remains of carts with revolving axes survived in Cyprus.

In the first millennium BC Chariots were often depicted on Assyrian palace reliefs (Fig.98).

Chariots depicted on stone reliefs of Ashshurnasipal II and Shalmaneser III (9th cc. BC) are shown in plan with a «D»-shaped platform and a low body front. Crew consisted of two men, rare of three men. Wheels are shown with six spokes (enemy chariots: 8 spoked wheels); the wheels rotated on fixed axes, located in the rear of the platform. Wooden rims of wheels are wide and consisted of three or six segments. A draught-pole of «Y»-shaped type. Depicted were predominantly trigas (two horses under a yoke, the third is outrunner). Four horses were only used for the royal chariots.

On the reliefs of Tiglathpalasar III and Sargon II (2nd half of 8th cc. BC) shown is a different kind of chariots: with a rectangular platform and higher sidewalls of the body. Wheels increase in diameter and have 8 spokes. «Y»-shaped draught-poles are provided with a single yoke for the four harnessed horses, in contrast to yokes-saddles, individual for each horse.

Reliefs of Sennacherib and Ashurbanipal (7th cc. BC) show a similar to the above-described type of chariots, which, however, is increased in size. Wheels of the royal chariots are fitted with ribbed tires. There are blinders in the bridle, horse head pads, draught-pole decorations and soft bits of several types. During this period,

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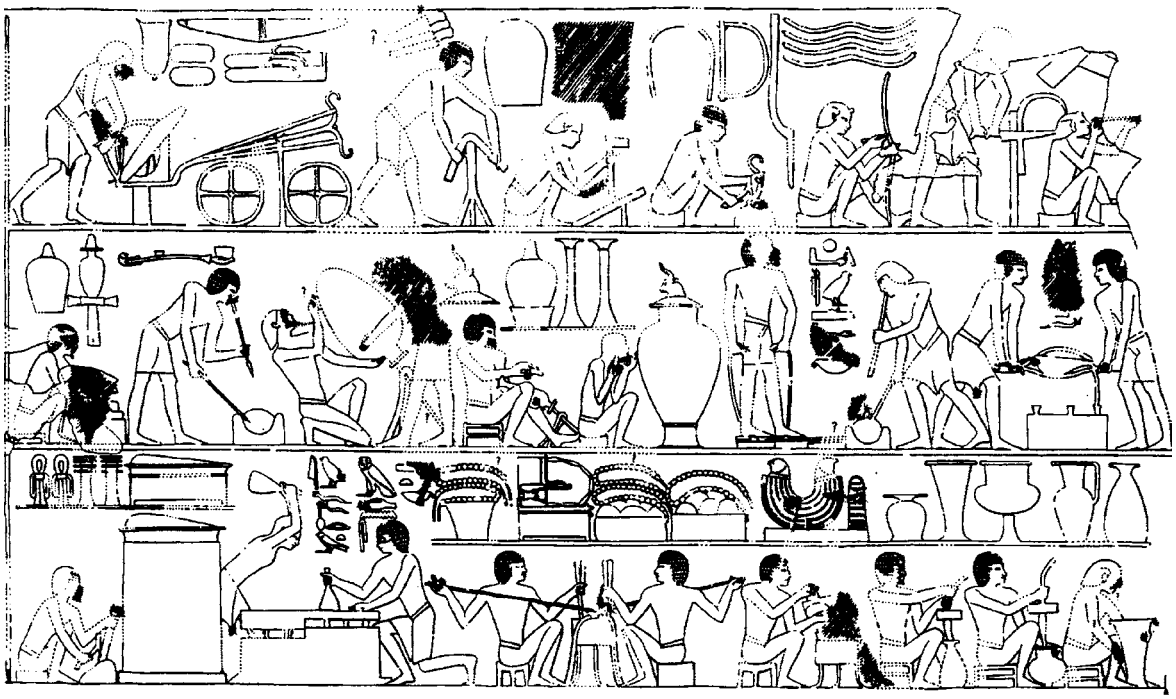

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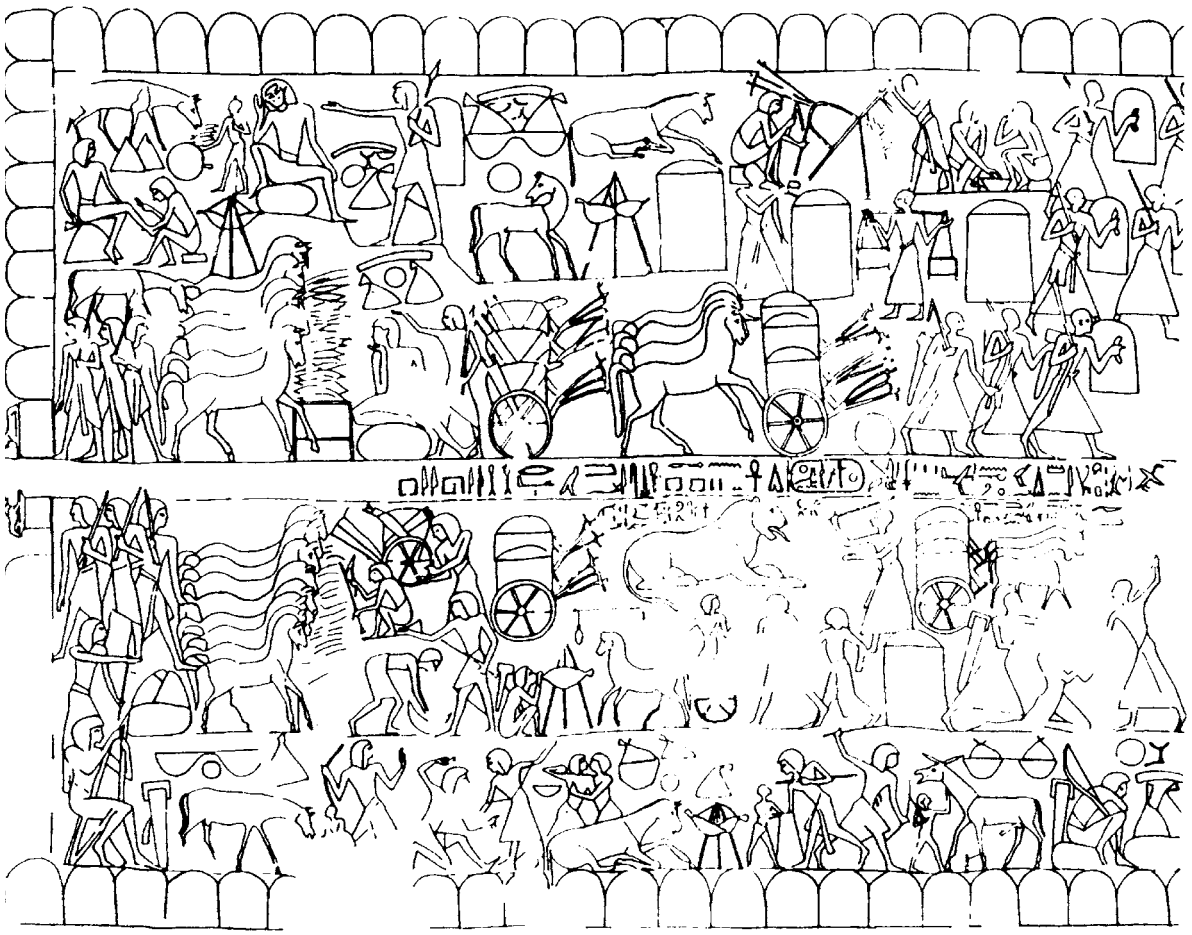


Fig. 99 A. The process of making the chariots [Herold, 2004, s. 125, 137, abb.2, 18].
1 – Tomb Puemri (Phoebe, grave 39), the period of Thutmose III (1479-1425 BC); 2 – Temple of Ramses the Great (1279-1213 BC) in Febah, field camp army of Ramses .

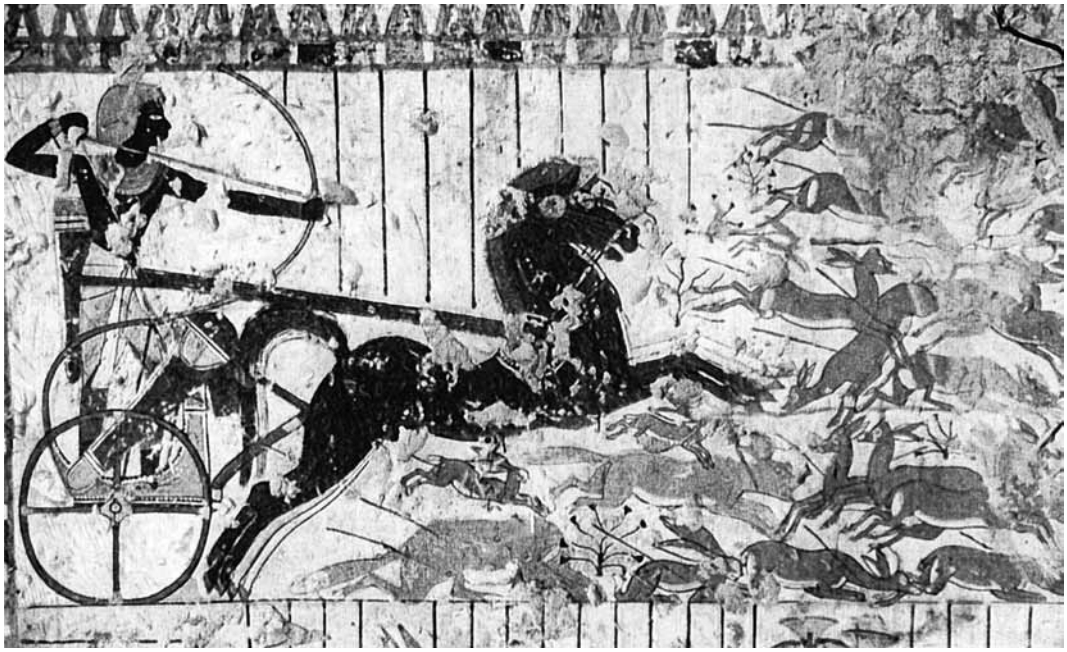


Fig. 99B. Uzerhet, Pharaoh Amenophis II's assistant (1428-1397 BC, Phoebe, grave 56).The scene of hunting. The reins are attached to a belt. [Herold, 2004, s. 126, abb. 3].

other types of chariots were also known, for example, with two draught-poles from Cyprus.

In the second half of the first millennium BC chariots are described in the Achaemenid and Greco-Persian sources. These are vehicles with a rectangular body; side panels are of different forms. Gigs are light passenger carriages with seats. The axis is placed at the rear of the platform; the wheels are fitted with tires of a ribbed surface. The famous Necin's breed horse appears in harnesses.

Design of chariots of the first millennium BC has a tendency to weighting. Although, in comparison with former times, chariots lost their inherent maneuverability, they still function as mobile platforms for shooting archers on a battlefield. The crew is increased up to four men; the rear is protected by an armor-bearer performing exclusively defensive tasks.

At the last stage in history of chariotry, attempts were made to revive their former glory and power: sickles were attached to the axles of chariots (of the Achaemenids and then of the Hellenes) for destruction the enemy's combat order. [Nefedkin, 1998, p. 10, 2001].

Cavalry very soon proves its advantages in battle tactics, and chariots loose their military role. They are increasingly used in religious and official purposes. And also this function is gradually lost for chariots at the turn of a new era. Main types of carts and gigs keep improving and are preserved until our days [Littauer, Crouwel, 1979, p. 68-71]. ■

An Asian chariot complex

By the beginning of 2nd millennium BC, two necessary prerequisites developed in the steppe societies for the use of light, fast and maneuverable horse-drawn carriages, chariots. They were elaborated for undoubted military and ceremonial functions but primarily as a means of managing huge herds of domestic animals, especially, of very mobile, little-steerable herds of horses, and also for hunting, which was an important way to replenish resources of these societies.

The study on the steppe chariots is based data on horse domestication, on findings of vehicle items and elements of a special chariot harness in the steppe monuments, as well as on the analysis of images on stone walls of the tombs, pottery, cylinder seals, which certainly date from the archaeological cultures.

Evolution of steppe vehicles in the preceding period is evidencing serious efforts to modify the heavy four-wheel vehicle towards its lighter weighing and improved maneuverability in order to adapt to physiological characteristics of a new draught animal, a horse. Whatever controversial may look the reconstruction of a gig from the Tyagunov grave, the fact of its findings is a striking evidence of such attempts. [Izbitser, 2010, p. 187-194].

On domestication of horse

Utilization of horses has brought fundamental changes in modes of moving, economic and military affairs, trade, hunting, in short, in all major steppe activities.

The ancient center of horse domestication in the European part of the continent is represented by osteological materials of the culture Sredni Stog II in Ukraine (Dereivka, Repin Khutor, oth.). By the end of IV millennium BC, 60% of all osteological materials in the settlement Dereivka made up of horse bones, and in the settlement of Repin Khutor up to 80%. Morphological features of bone materials clearly indicate the existence of domesticated livestock [Bibikova, 1967, p. 106-118; Bokony, 1984, p. 10; Nobis, 1971].

Existence of a horse domestication center was supposed theoretically in the Asian part of the Eurasian steppe [Bokony, 1984, p. 9-11]. This assumption is confirmed by the finds from the settlement of Botai in Northern Kazakhstan [Zaibert, 1985, p. 3-17, 1987, p. 63-64]. Here, 99% of the osteological materials were the bones of horse. The statistical comparative analysis shows similarity of biometric parameters with that of Dereivka, the Eastern Europe, as well as of synchronous Eneolithic finds from settlements in Solionoe Ozero I, Roshinsky and of the Bronze Age settlements in Kazakhstan (Atasu). This similarity provided grounds for relating the Botai horses to a domesticated form [Nurumov, Makarova, 1988, p. 12-20], which is disputed by some studies [Kosintsev, 2002]. The settlement Botai dates back to the final phase of the Atbasar culture which develops on the local Neolithic basis since the end of 4th and in 3rd millennium BC [Zaibert, 1985, 1987].

The study of material cultures of the Eneolithic Tersek and Surtandy tribes in northern Kazakhstan and the adjacent areas shows their genetic similarity to the Pit's, the Afanasievo and to the later Andronovo monuments [Logvin, 1991, p. 51-52; Matyushin, 1981].

Anthropological materials from burials in the Botai settlement were attributed to a proto-European type, typical for popu-

lation of eastern spread of the Caucasian race and close to the anthropological type of Afanasievo population of the Altai-Sayan uplands. These materials suggest the existence of the southern contacts between Botai population and the areas of spread of agricultural cultures of Turkmenistan, northeastern Iran, and the Mediterranean with the fixed forms of the equatorial racial features [Rykushina, Zaibert, 1984, p. 121-136]. These data well correlate with the situation described in the previous chapter.

Judging by the finds from the Botai settlement, the horse domestication processes in the European and Asian parts of the Eurasian steppe are synstadial phenomena intrinsic exclusively to the steppe pastoralist communities.

At the same time, the horse domestication process radically differs from the earlier forms of domestication of sheep, goats or dogs. V.B. Kovalevskaya believes that, in regard to the development of horse breeding, herdsmen-shepherds became first riders in the Dnieper tribes [1977, c. 150].

V.A. Schnirelman believes that the horse-breeding in the Eneolithic cultures was aimed mainly at production of meat, and excludes an early appearance of more complex forms of horse domestication which could enable its use for riding [1980]. Then we should understand how it was possible to control such large herds, numbering hundreds of horses without an ability to ride them (this number is provided by the osteological materials of Dereivka, Repin Khutor, Botai settlements).

The argument in favor of the early horse riding was supported by findings of bone articles in the form of a rod with holes found in the settlements Dereivka, Repin Khutor and the Afanasievo graves [Telegin, 1973, s. 324-327; Kozhin, 1970]. However, these findings, by the analogies from the Shang-Yin tombs, are defined as devices for undoing nodes [Kommissarov, 1980], and V.F. Zaibert identifies similar objects as horse lock details [Zaibert, Danilenko, Gorbunov, 1990, p. 60-66].

The earliest primitive organic bits of rope or leather were so painful to a horse that did not require additional devices, psalii, for riding, when the rider has plenty of opportunities for direct control of a horse.

Riding was restrained by the herd instinct of horses, overcoming of which required a long-lasting selection. In addition, the horses hooves would erased much faster under a rider's weight, and yet no devices for their protection in archaeological materials were recorded so far.

I do not exclude the early attempts to mount a horse in the very herd, as suggested by V.B. Kovalevskaya. At the same time, the real control over the large herds of horses can be kept only by driving a small horse-pulled gig of the same type as that found in the Tyagunov Mogila in Ukraine. The function of exploration, a search for new fertile pastures and a survey of new steppe areas, was also an ever-topical issue. Besides, harnessing team by itself was already the most effective step in the process and an effective means of taming horses.

Successful selection of horse breeds, needs of the pastoralist economy are likely to propel the invention of a new type of vehicle, a light chariot with spoked wheels and new bits in combination with shield cheek-pieces with spikes for a more rigorous remote control. Since that time, such a horse chariot along with a van, became the main types of vehicles in the steppe.

These data indicate the formation of at least two centers of early domestication of horses in the Eurasian steppe zone. Already at the end of 4th millennium BC domesticated forms of horses spread over a vast area of Central and Eastern Europe [Boko-

ny, 1984, p. 11-12; Bokony, 1978, p. 17-76]. In the eastern part of the Eurasian steppe, such spread of domesticated forms of horses is little studied. According to the Chinese chronicles, the Shan and West Zhou rulers received horses from the steppes [Kozhin, 1969, 1977]. Horses reached South Turkmenia already being domesticated, and it occurred only in the second half of the 2nd millennium BC [Kuzmin, 1988, p. 322]. According to paleozoologists, the most ancient domestic horses of India originated from an eastern (steppe) breed [Azaroli, 1975, p. 353-355].

Thus, domesticated horses, apparently, served as an important means of exchange between steppe pastoralists and the settled agricultural societies. Moreover, steppe men in 3rd-2nd millennia BC had monopoly on selection, breeding, rearing and supply of trained horses. This conclusion is of fundamental importance in subsequent reconstructions and specifies the nature of the communication channels, emerging during this period.

Steppe chariots

In the Asian part of the steppe Eurasia now investigated is a large series of burial grounds and the group of mounds with remains of wooden chariots, which were possible to record thanks to the tradition to set their wheels in special grooves on the bottom of the grave. In some cases, sharp prints of rim and spokes remained on the walls and in the grooves, and in one case traces were recorded of remains of a rectangular platform and of a nave.

Monuments of this type are known in the Southern Trans-Urals (Sintashta, Nikolaevka II), in the Northern (Kenes, Ulubay, Berlik II, Novonikolskoye) and Central Kazakhstan (Satan, Aschisu, Bozingen, Nurtai) [Zdanowicz, 1988, p. 71-76, 138-140; Gening, 1977, p. 66, 69, Fig. 1 – 3, Evdokimov, 1981, p. 434; Novozhenov, 1989, p. 110 – 122; Epimakhov, Chechushkov, 2006, 2008, 2010; Kukushkin, 2011, 2011a], as well as in the Pre-Urals [Anthony, Vinogradov, 1995], (Fig. 100).

An important part of the ritual is the burial of horses. Usually two horse skeletons lay on clay of under-barrows floors or on the grave ceiling. The heads are oriented to west; legs are arranged as if in a run. Sometimes, instead of the whole carcass, only the skull and shanks were placed [Zdanowicz, 1988, p. 135-136].

Most indicative of the entire series of tombs of this type were the burials in the barrow group Berlik II (Fig. 101 – 102). Here, in the mound 2, of 18 m in diameter, 0.2 m high, around the central grave pit, a ring of clay was fixed up to 20 cm thick and a clay court, on which two horse skeletons were placed, heads to the west. There were two skulls and four pairs of legs of bulls or cows at the eastern edge of the grave. The grave pit is of sub-rectangular shape, 5.2 x 4.1 m, laid out with clay blocks (?) up to 20 cm thick on walls and the floor. In the filling of the grave, there was a part of a collapsed grave clay ceiling; there were two dog skeletons without skulls, animals' incisal teeth and three pairs of large fish gill-covers. There were a skull, teeth and ribs of horse on a ledge of the tomb. On the bottom of the burial chamber preserved were bronze awl and a clip, fragments of 16 vessels at different depths; and in the eastern part of the tomb two parallel holes for wheels. The cross-section's background clay filling contained a rim part and two spokes in the northern groove, and a fragment of the rim and imprints of the three spokes in the south groove [Zdanowicz, 1988, p. 74-76, Fig.29-32].

In Central Kazakhstan, 3 km west from a Pit's mound of the Karagash burial ground, another burial ground, Satan, was investi-

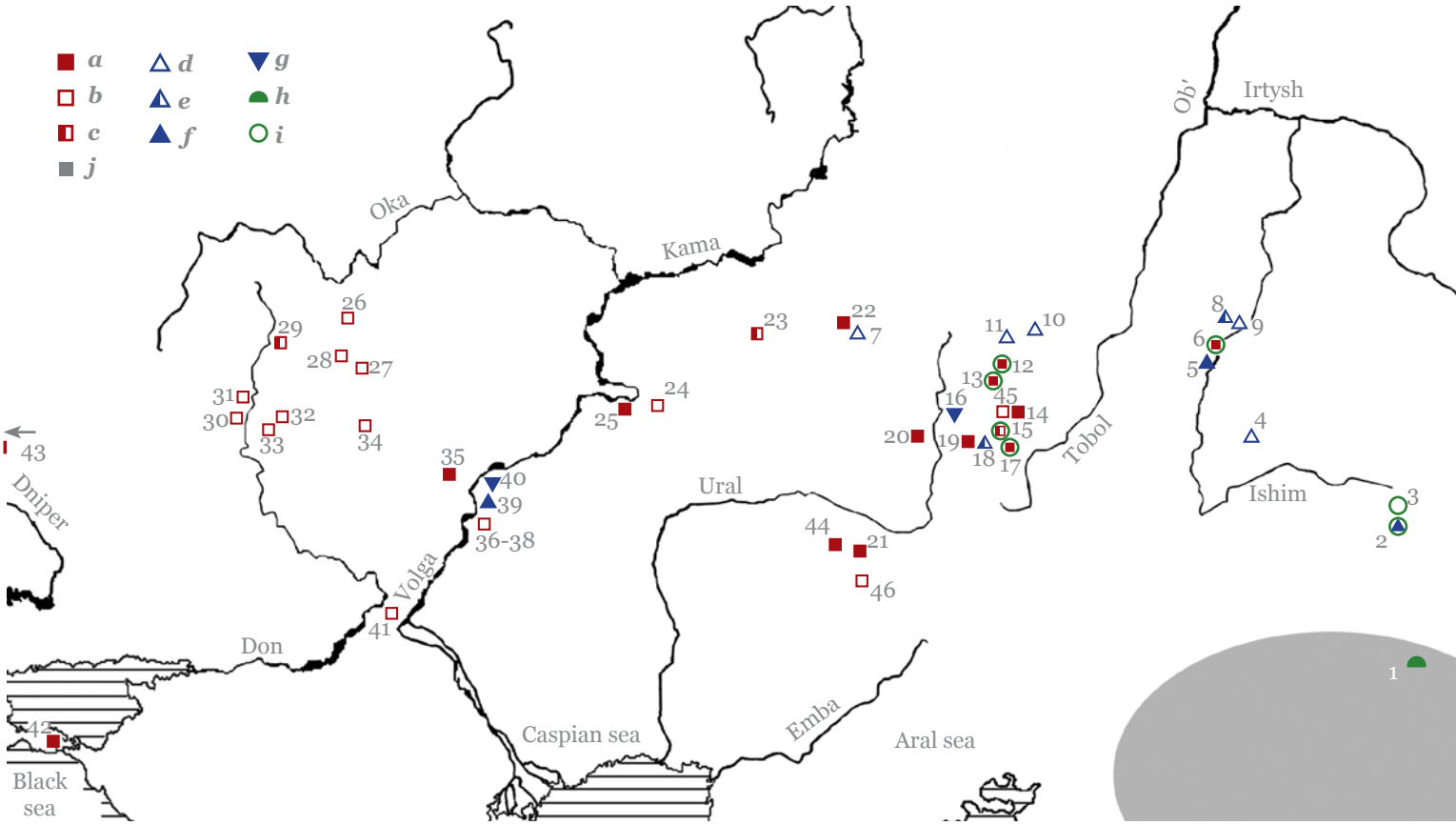


Fig. 100. Map of the spread of the chariot complex in the Ural-Kazakhstan steppes. [Chechushkov, Epimakhov, 2010, fig. 8, p. 213].
1 – Atasu I; 2 – Satan; 3 – Nurtai; 4 – Aydabul; 5 – Aksayman; 6 – Berlik II; 7 – Kazangulovo I; 8 – Petrovka II; 9 – Novonikolskoe; 10 – Alakul; 11 – Shibaev I; 12 – Crooked Lake; 13 – Solntse II;14 – Kulevchi III; 15 – Kamennyi Ambar 5; 16 – Spassky; 17 – Sintashta; 18 – Mirnyi IV; 19 – Bolshekaragansky; 20 – Tavlykaevo IV; 21 – Tanabergen II; 22 – Balanbash; 23 – Potapovka; 24 – Krasnosilka; 25 – Utevka VI; 26 – Staroyurevo; 27 – Drake; 28 – Pichaevo; 29 – Filatovsky; 30 – Kondrashevka; 31 – Bogoyavlenka; 32 – Sofyino; 33 – Kondrashkinsky; 34 – Vlasovsky; 35 – Bolshaiya Dmitrievka; 36 – Berezovka; 37 – Staritskoe; 38 – Borodaevka II; 39 – Krasnopolie; 40 – Sykhaya Saratovka I; 41 – Barannikovo; 42 – Kamenka; 43 – Trahtemirovo; 44 – Obilkin Lug; 45 – Ustie; 46 – Ilekshar. a – the monuments containing psalii with solid spikes; b – monuments containing psalii with false spikes; c – sites, containing both types of psalii, d – sites that contain psalii without thorns; e – sites that contain both types of psalii with spikes and without spikes; f – sites that contain a psalii from the shattered bones; g – sites that contain vessels with images of chariots; h – sites that contain rod-like psalii; i – finds of chariots; j – area distribution of petroglyphs with images of chariots.

gated. Three mounds were excavated on slopes and the top of a small hill of the same name (Fig. 103A); there are Alakul' fences with stone boxes at the foot of the hill.

The mounds' structure coincides with the described above, with the only difference that there was no under-barrows clay floor in the Satan burial ground, and walls of the tomb pit were not laid out in clay. Timber blockings of solid tree trunks laid in 2-3 jostling were found in the central graves. All the graves were robbed and set on fire in ancient times.

In the central burial pit of the mound 1, unburned separate parts of a chariot installed on the pit bottom, were cleared. Recorded were remains of the body's rectangular platform 106 x 60 cm and 10 cm thick. The upper part of the floor retains poorly preserved pieces of wood. Under the

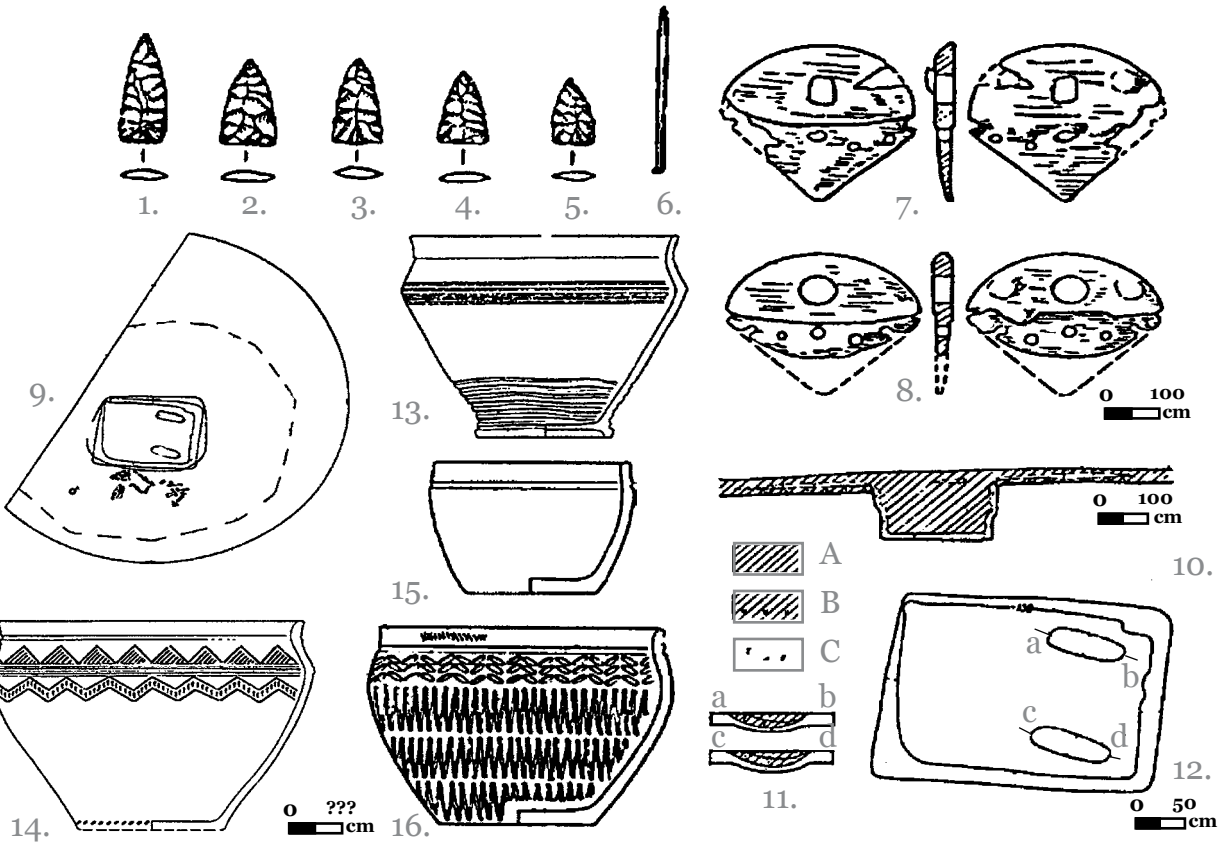


Fig. 101. Northern Kazakhstan. Cemetery Berlik II, barrow 10. 1-8, 13-16 – artefacts; 9, 10 – plan and section of the mound; 12 – plan of the burial pit; 11 – sections of wheel groove; 1-5 – stone; 6 – bronze; 7-8 – bone; 13 – 16 – clay; a – humus; b – buried soil; c – clay. [Zdanowicz, 1988, Fig. 31].

wood dust of former platform, two parallel rectangular rabbets were seen: the first contained remains of a charred rim and a nave, the second rabbet had a fragment of a rim with a circular groove for spokes and dust of a wheel nave. Under the rim survived were: a small piece of red rawhide and 4 tapered bone nail 8-17 mm long, which apparently used to fasten a leather tire on the rim from inside. Found in the graves of the mounds 1, 3 were: the cheek-piece with spikes, ornamented with carved lines, separate bones of animals and humans, and ceramic fragments [Evdokimov, Varfolomeev, 2002, p. 20-23, Figure 3, 4].

Imitations of the chariot burials in the Kazakh low hills were also found in the Nurtai burial grounds [Tkachev, 2002, p. 161-165], Ayapbergen, Aschisu [Kukushkin, 2007, p. 40-65, 2011, p. 110-116]. Materials on the latter monument demonstrate excellent examples of weapons: bronze spears, a dagger knife, a hook and flint arrowheads (Fig. 103, 157A). The chariot complex includes the following objects: a bone ornamented cheek-piece, a bone ornamented clutch with a bronze tipped goad. Among the rare and unique finds of this burial ground is a sharp-ribbed copper vessel on a ring tray. The radiocarbon analysis by the horse bones indicated a period from the end of the 3rd to beginning 2nd millennia BC [Kukushkin, 2011, p. 110].

All presently known chariot findings originate from the Sintashta, Petrovo and Alakul' monuments in south Trans-Urals,

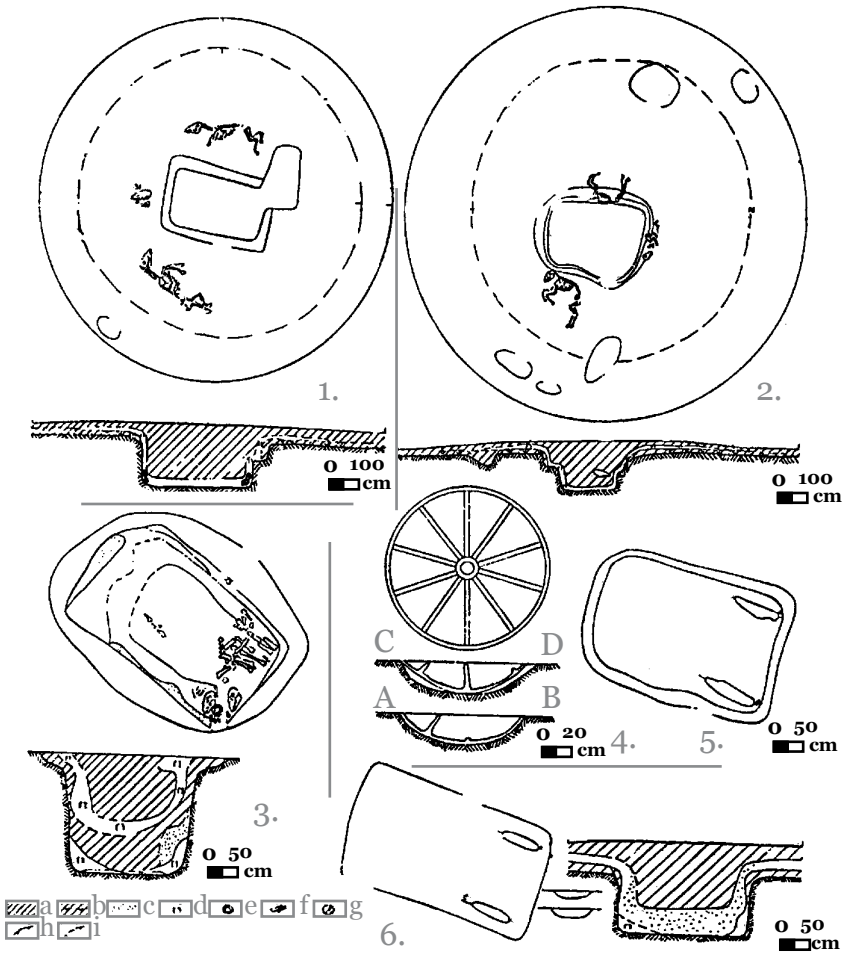


Fig. 102. Northern Kazakhstan. Cemeteries at Berlik. 1 – Berlik II, barrow 1, plan and section; 2, 4, 5 – Berlik II, barrow 2, plan and section of the mound, slits of grooves, the reconstruction of the wheel; 3 – Kenes cemetery, barrow 3, pit 3, plan and section; 6 – Kenes cemetery, barrow 5, plan and section of the burial pit; a – humus; b – buried soil; c – loam; d – clay; e – a vessel; f – animal bones; g – a tree; h – the boundaries of the excavation; i – the boundary clay sites. [Zdanowicz, 1988, fig. 29].

Northern and Central Kazakhstan. Information on more than 20 chariots was published.

The Bestamak funerary complex, located within the Turgay ravine, is also of interest: in addition to the shield psalii, recorded were paired and unpaired horse burials, and in one case, three skeletons were in standing position. A cross-shaped decorated mace was among the accompanying set of objects, which is not only a symbol of power, but along with battle-axes (represented here by bronze specimens), is also part of the chariot complex [Kaliyeva, Logvin, 2008, p. 32-58].

In recent years, Ural researchers A. Epimakhov and I.V. Chechushkov achieved significant progress and impressive results in the study of chariot complexes [2006, p. 168-182, 2008, p. 205-211, 2010, p. 182-229]. According to the authors, the concept of «a chariots complex» include: the actual remains of chariots and their parts in the graves, the remains of reins findings of psalii; a charioteer's set of weapons, as well as pictorial sources – drawings on vessels and related petroglyphs [2008, 2010, p. 182].

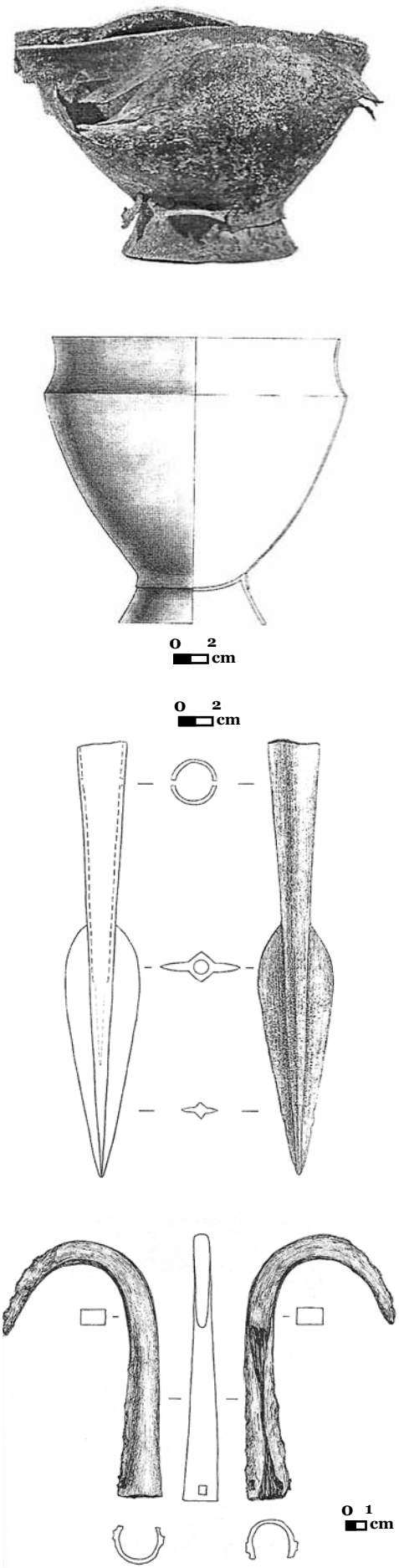


Fig. 103. Central Kazakhstan. Cemetery Aschisu. Inventory: 1-2 – bronze vessel, 3 – bronze spear, 4 – bronze hook. [Kukushkin, 2011, p. 110-116].

Since in steppe tombs the chariots were preserved in fragments, the most interesting would be their reconstruction [Gening, et al, 1992, p. 218-219; Anthony, Vinogradov, 1995]. The first reconstruction based on materials from the burial grounds of Sintashta and Krivoe Ozero were rightly criticized [Littauer, Crouwel, 1996, p. 934, 939 etc.] on the basis of a single parameter: the nave length, which in the reconstructions appeared too short to consider the gigs as real battle maneuvering chariots, not quite suitable, in their opinion, for use in the surrounding steppe landscape.

A more objective reconstruction was made on the basis of the mathematical analysis of the entire series of burials and the computer simulation [Epimakhov, Chechushkov, 2006, p. 168-182, 2008, 2010], indicating a certain common «model», or the standardized technical parameters of the vehicles (Fig. 104): a wheel 80-100 cm in diameter had minimum 9-12 spokes of 4-5 x 4-5 cm in cross-section; a rim had an outer leather tire (fitted by rawhide, which from inside of the rim was nailed by bone nails – VN);

An axis of minimum 160-180 cm long, with the wheelbase (a distance between wheels) of 110-130 cm;

A nave, both diameter and length of which did not exceed 15 cm, judging by the surviving remains of the outer side of wheels. The wheel was fixed on the axle by check-rods inserted in a special hole; the check-rod outlines were fixed 10 cm from the ends of the axis. (I'd like to note that the clearing of a monolith block with remains of the wheel and the nave of the chariot from the Satan burial ground under the labora-

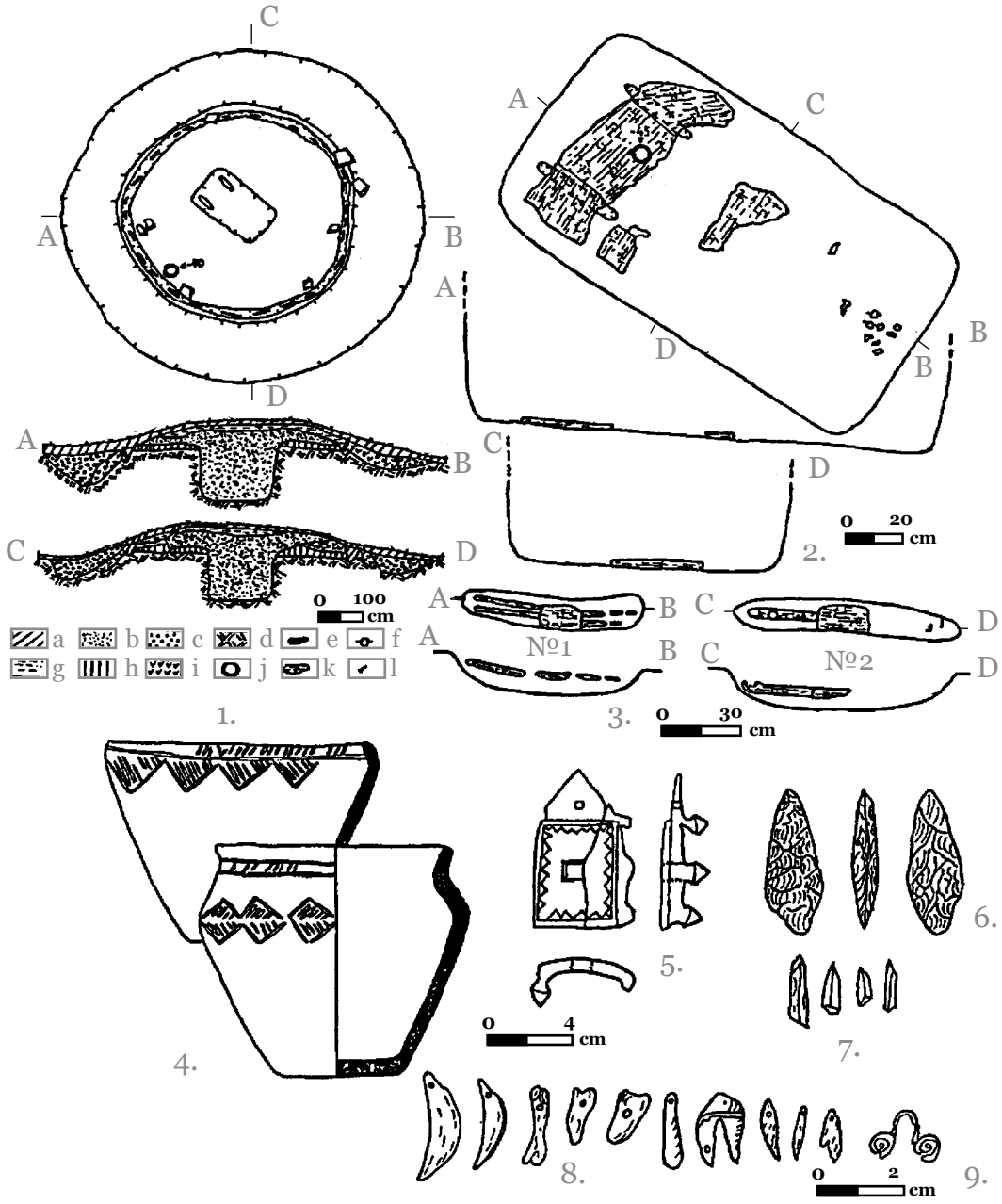


Fig. 103A. Central Kazakhstan. Cemetery Satan. 1 – plan and sections of the barrow 1: a – layer of humus; b – light brown loam; c – brown loam; d – buried soil; e – dark brown loam; f – black loam; g – mainland; h – ceramic vessel; i – dug on the edge of plate; j – the remains of the tree; k – vertebral bones of man; l – ivory nails; 2 – plan and sections of the grave with the remains of the chariot; 3 – the groove with the remnants of the wheels; 4 – vessels from barrow 1; 5 – bone psalii from barrow 3; 6 – stone arrowhead from barrow 3, burial pit; 7 – bone nails is attached to a row-hide (leather) rim of wheel; 8 – amulets from animal bones; 9 – bronze suspension, barrow 3, burial pit.

tory conditions, in presence of the author, witness a much more massive and long nave, min 30 cm, ashes of which were on both sides of the rim);

A body: rectangular, wooden, woven of twigs or compiled from boards, with dimensions of the base 110-130 x 80-100 cm, with the front rail 90-100 cm high (only theoretical reconstruction – VN). The body was located above the axis or was slightly shifted forward to draught animals.

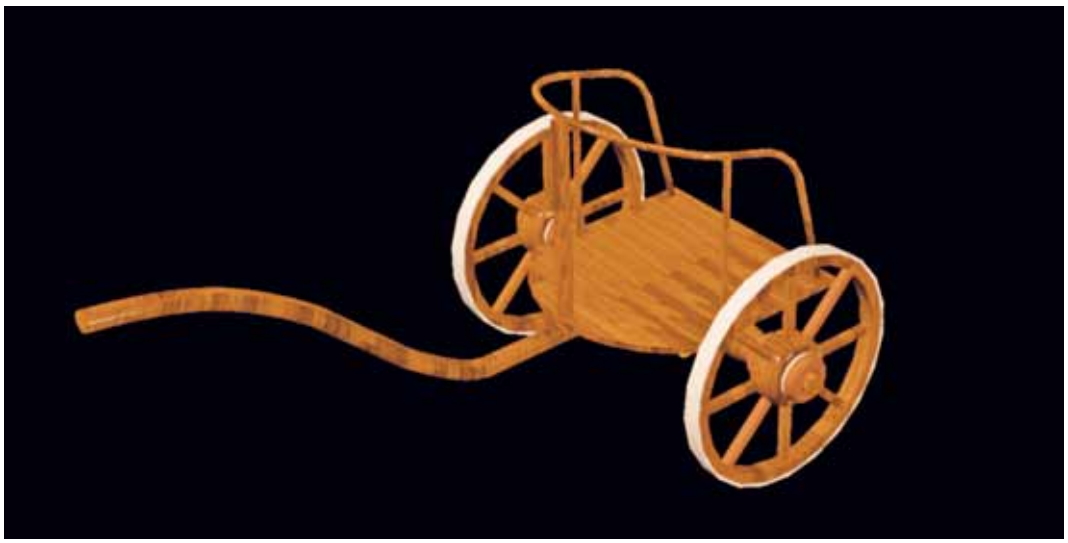
Data on a draught-pole and harnessing methods were reconstructed on the base of an analysis of physical parameters of buried horses, their format and an assumption that gallop was the main working gait of chariot horses. At that, minimum draught-pole length was 180 cm. A yoke of a straight shape evidently was fixed at the end of the draught-pole. Draft force was passed through a wide chest strap attached directly to the yoke and fixed on a horse with the girth and, possibly, with saddle-yokes.

Another important conclusion drawn by the authors upon the analysis of the entire series of burials with chariots, is that there is an explicit group of seven graves with «imitations» (Fig. 105), when «the installation of a chariot into a burial chamber was imitated and signified by the most bright features (wheel pits, psalii, horses, etc.), or a chariot was placed in a grave only during the funeral rite and then was extracted, so that the wheel imprints were left on the grave bottom. In some cases, when the size of a burial pit was very spacious, and the complex included psalii and horses, the chariot could be installed without inserting wheels into the bottom, or it was installed disassembled, as it is expected for the Don-Volga tradition «[Epimakhov, Chechushkov, 2010, p. 191-192, see: Vinogradov, 2000].

Chinese chariots

Findings from Chinese chemakyns, tombs with chariots of the periods of Shang-Yin, and Early and Late Zhou, Chun-Qiu and Zhanguo, can help specifying the design of the steppe chariots. Many researchers of the Chinese chariots suppose their borrowing from the steppe regions of Eurasia, as it is unambiguously evidenced by similarity of technical parameters, of the burial rite and the written sources data: inscriptions on bones and ancient Chinese chronicles [Kozhin, 1969, 1977, Vasiliev, 1976; Watson, 1978, p . 1-32; Piggott, 1978, p. 32-52; von Dewall, 1986, s. 168-186; Jam, 1980, p. 164-169; Komisarov, 1980, p. 156-163, 1988, p. 54-56; Novozhenov, 1989, p. 110-122]. Borrowed from the steppe envi-

Fig. 104. Modeling and computer reconstruction of steppe chariot made by Igor V. Chechushkov [2011].



ronment were some Chinese myths associated with the idea of a chariot [Yevsyukov, Komisarov, 1984, p. 52-67, 1985].

The most complete and detailed summary and analysis of all burials with chariots in China were recently published by the Taiwanese researcher Wu Hsiao-yun [Wu, Hsiao-yun, 2009]. In her paper, she analyzes more than 230 specimens of actual chariots from burials of the Shang-Yin epoch to chariots of the Emperor Qin Shi Huang, as well as features of funeral rites and topography of burial sites, where they were found. The author also provides a large series of tombs with fixed «imitations», or placement of disassembled chariots [Wu, Hsiao-yun, 2009, p. 49-59]. The author examines in detail the typology of vehicles, based on evolution of some of their manufacturing techniques and practical applications [Wu, Hsiao-yun, 2009, p. 22-42].

The Shang-Yin chemakyns were found in Anyang, in places near the village of Dasykuntsun, Xiaomintun [Kucera, 1977, p. 133-142; Jam, 1980, p. 164-169], Gotszyachzhuan, Xiaotun (Fig.106-107). These monuments appear to be most representative. The excavated chariots were carefully cleared, according to changes in color of the soil and traces of decay of wooden structures, and in general, were preserved better than vehicles in the steppe barrows. The Shang-yin chariots were also found in the monuments of Tsyaobey, Baydzyafyn, Meyyuandzhuan, Lyutszyadzhuan, Tsyanchzhanda and others (see Appendix 2).

The Early Zhou chariots occur from chemakyns of in northern and, rarely, central provinces of China, in the monuments of Baytsyaopo, Chzhanzyaopo (Fig. 108-109), Lyulihe, Chzhaogu, Chantayguan, Shantsunlin, Fenshuylin, Yunindun, Tsaytszyagan, Nanshangen, Bayotszy, Sikun, Syaoheshigou and other [Komisarov, 1980, p. 156-163, 1988, p. 54-56; Wu, Hsiao-yun, 2009, p. 211-231]. There are about 30 known monuments in total of this period. More than twenty monuments relate to periods of the Eastern Zhou, including Chun-Qiu and Zhanguo periods. In total, more than 60 monuments of earlier periods with chariots are known in the territory of modern China.

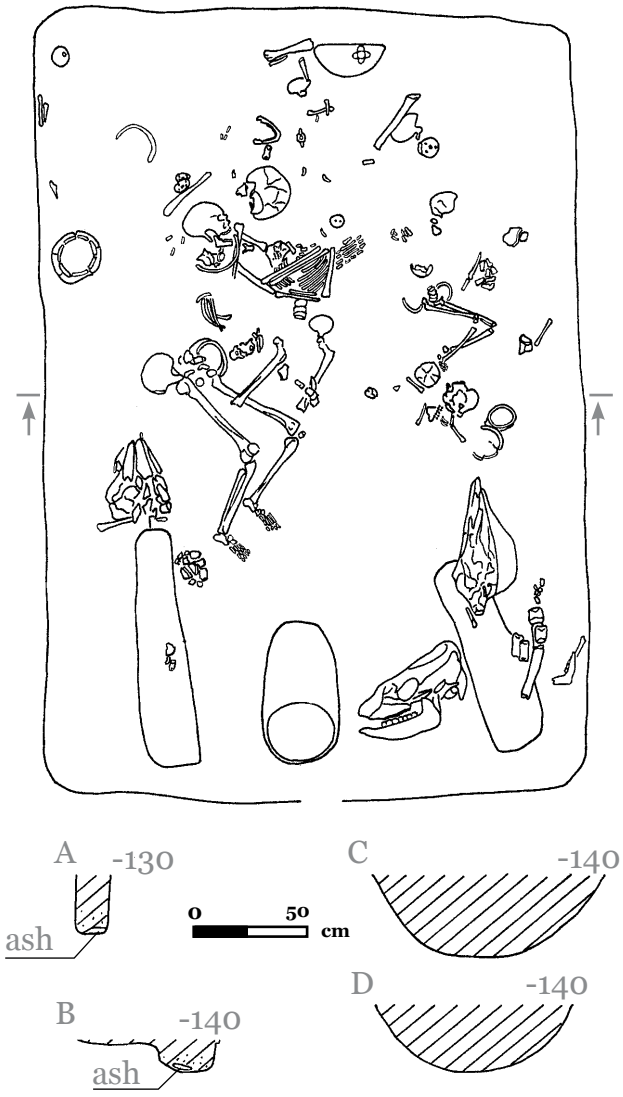


Fig. 105. Simulation of a chariot burial (KA5K2YA8). The cemetery Kamennyi Ambar 5, barrow 2, tomb 8. [Epimakhov, Chechushkov, 2006, fig. 5].

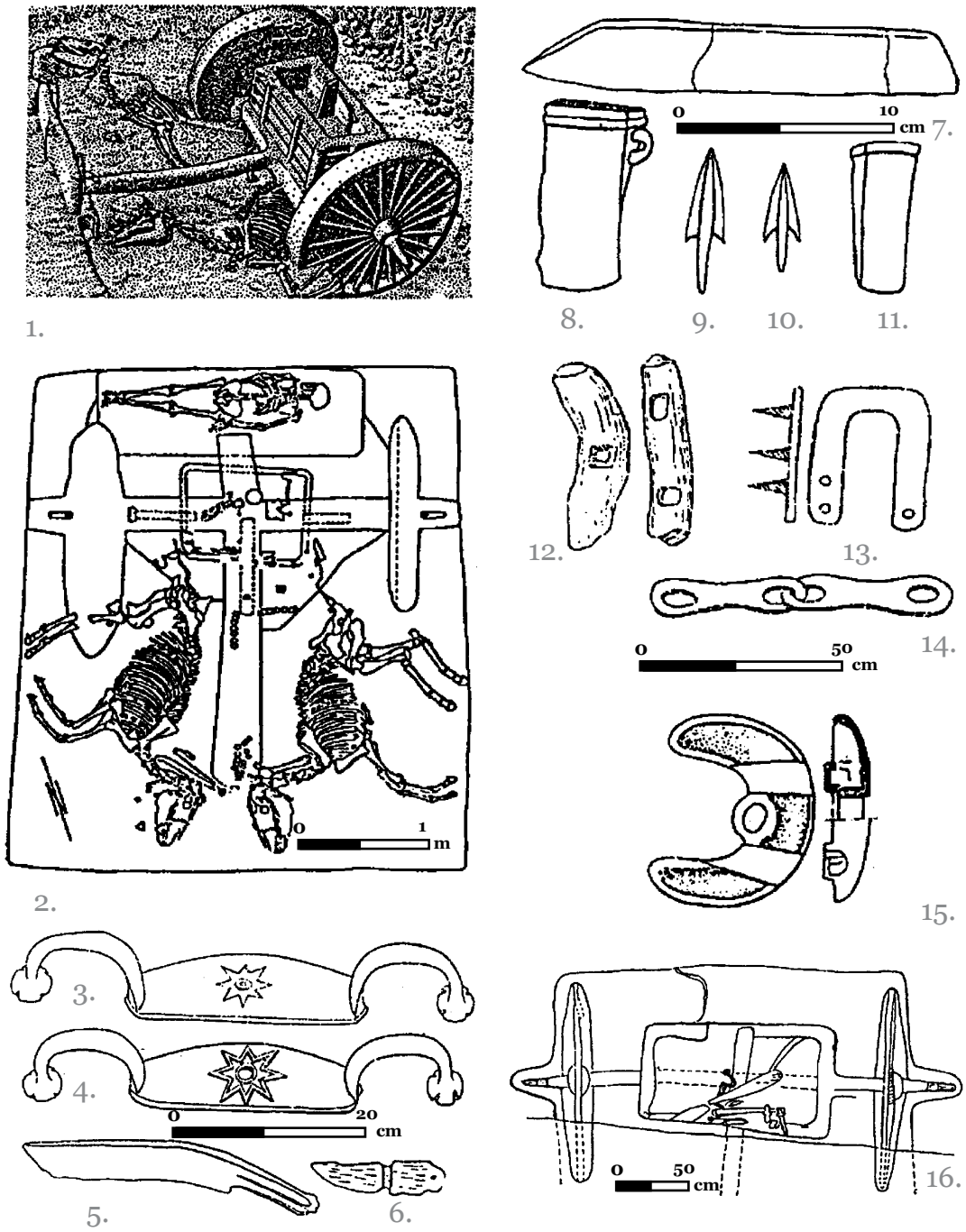


Fig. 106. China. Graves with chariots (che-ma-kyns). 1 – general view, Xiaomintun; 2 – a plan of chemakyn M175, Dasykuntsun; 3 – 4 – a «models of the yoke»; 5 – a knife; 6 – terminal pad on the bow; 7 – klevets, 8, 11 – celts; 9, 10 – arrowheads; 3 – 5, 8 -11 – Bronze; 6 – Bone; 7 – Stone; 12 – 15 – items from the Bayfu: 12, 15 – psalii; 13 – thorns-amps, 14 – bit; 12 – horn , 13 -15 – bronze; 16 – chemakyn M43 in the western sector of the Anyang (Shang settlement). [Varionov, 1980, fig. 6, 17, 19; von Dewall, 1986].

Topography of the monuments

In the Shang-Yin time, graves with chariots are grouped, as a rule, around several graves, apparently, of close relatives and differ from graves of tribesmen by larger size. Together with chariots, the burials contain remains of draught horses and people. Thus, in the burial ground Xiaotun (Anyang, Sec-

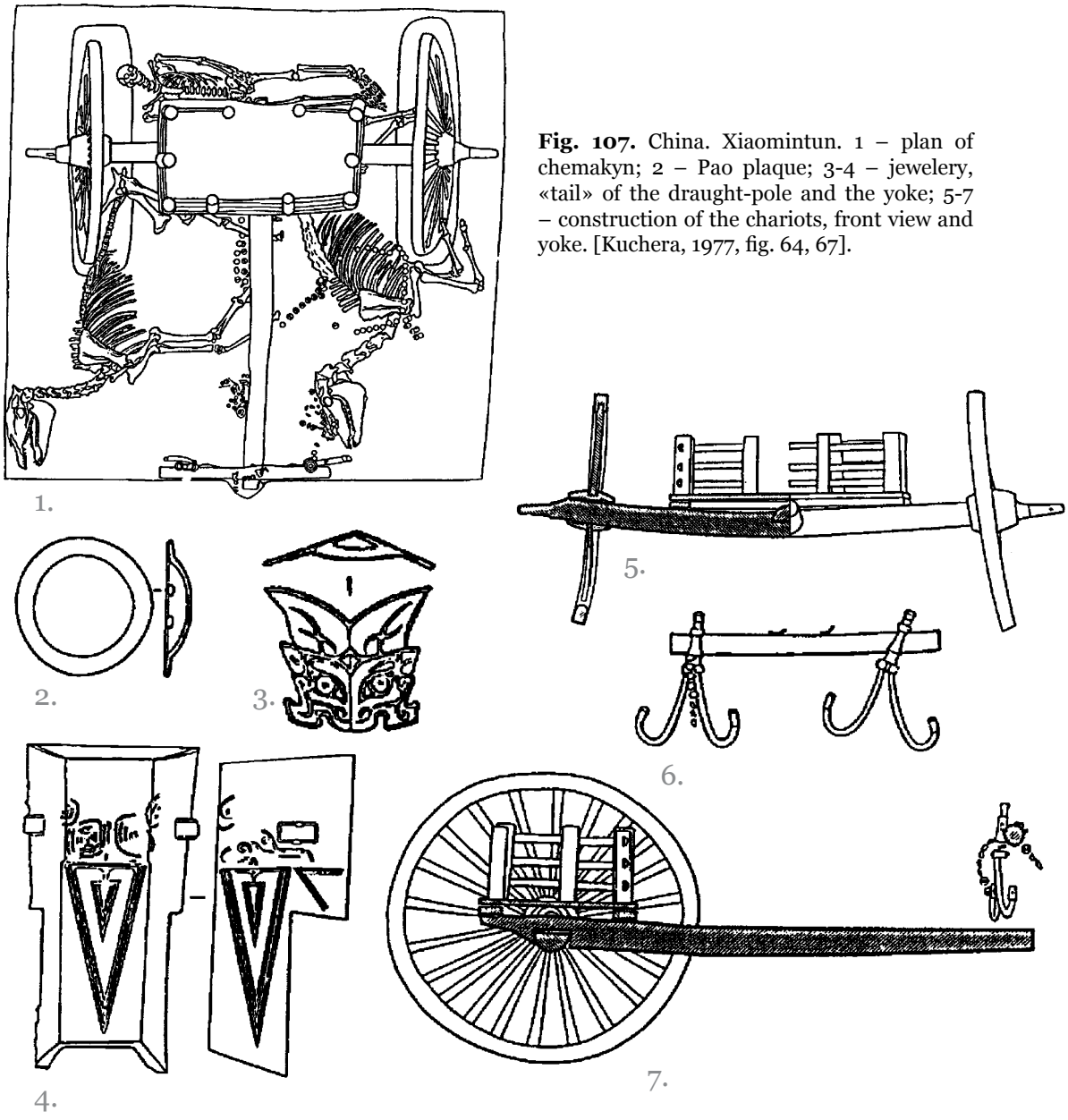


Fig. 107. China. Xiaomintun. 1 – plan of chemakyn; 2 – Pao plaque; 3-4 – jewelery, «tail» of the draught-pole and the yoke; 5-7 – construction of the chariots, front view and yoke. [Kuchera, 1977, fig. 64, 67].

tion C), chemakyns M20, M45 and M202 are located within the distinct groups of graves, among which there is another big burial M40 with a chariot (Fig. 110-111).

During the Western Zhou, burials with chariots significantly increase in size, one grave contains already several carriages; there are burials with sacrificial horses and chemakyns with vehicles only. A tendency to group them around other graves is retained, more isolated though. It is well illustrated in the plan of the Shantsunlin burial ground, where large chemakyns are in separate groups (no. 1051, 1052, 1810, 1811 and 2011, 2012, 2013, 2016, etc.), and as part of separate groups of graves (no. 1715 1702, 1602 and others (Fig. 112-115). In the Lyulihe burial ground (Beijing district), 60% of the total list of objects is chariot equipment from four tombs only. In general, bronze weapons and chariot equipment, similar to that of Shang-Yin, most often occurs in a

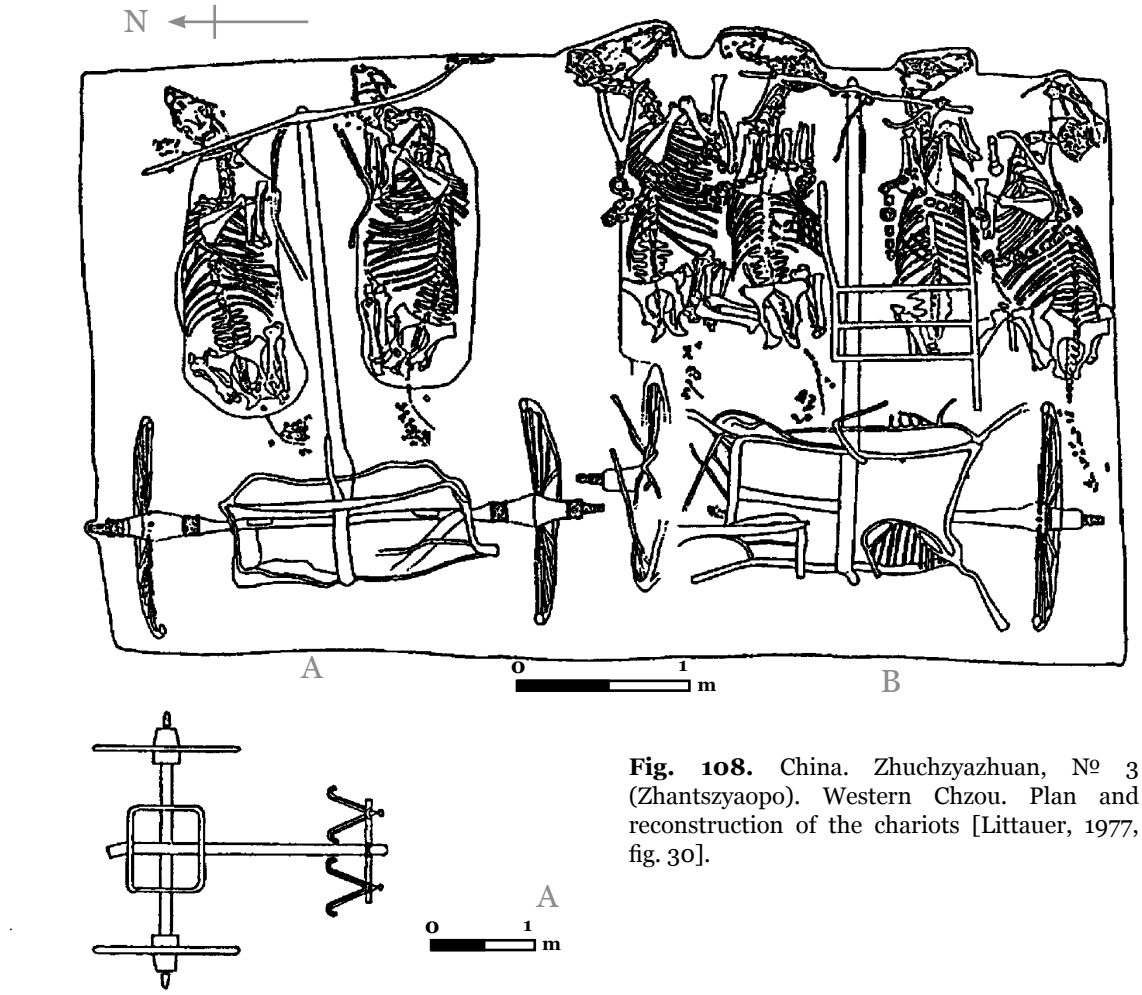


Fig. 108. China. Zhuchzyazhuan, № 3 (Zhantszyaopo). Western Chzou. Plan and reconstruction of the chariots [Littauer, 1977, fig. 30].

single complex. Attractive are the following features of the funeral rite: timber blockings and a rich set of weapons.

Finally, in the late Chunsyu, very large burials with chariots are completely separated from other graves; the burials with joint disposal of human corpses are virtually unknown (temple Sichuansyashi, M2, 8, 10, 11, 36, Fig. 116).

Typology of tombs with chariots

There are two distinct traditions of all the variety of chemakyns: real chariots installed in the graves (Fig. 117-119), and «imitation» of the installation (Fig. 120-126). The Shang-Yin time is characterized by single graves with a chariot (or its imitation), a pair of horses, one or two buried charioteers, while in the Early Zhou and later times different options and their combinations significantly increases.

Recorded are single chariot graves without people, objects or draught animals (e.g., an architectural ensemble Matszyachzhuan, K17, no. 1 [Wu, Hsiao-yun, 2009, p. 56, pl. 1]), or the chariot graves with objects (Fig. 123; Bantszyadzhuan, M5).

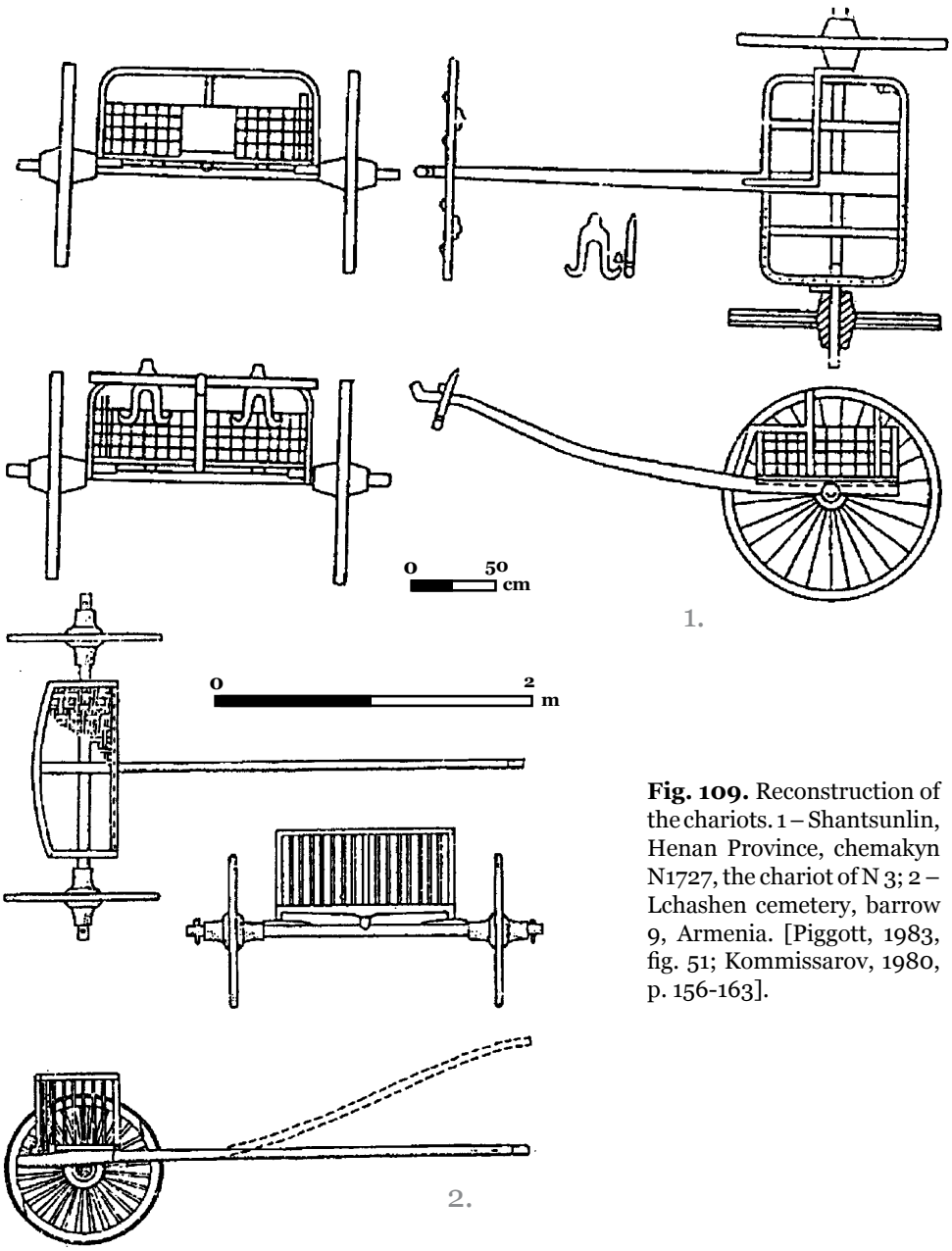


Fig. 109. Reconstruction of the chariots. 1 – Shantsunlin, Henan Province, chemakyn N1727, the chariot of N 3; 2 – Lchashen cemetery, barrow 9, Armenia. [Piggott, 1983, fig. 51; Kommissarov, 1980, p. 156-163].

The first tradition of building tombs with chariots represents different combinations: a chariot + draught animals; chariot (s) + draught animals + man (people) + sacrificial implements. Various combinations of these components are possible.

«Imitation» always implies chariot or its significant parts in disassembled state: these are, as a rule: wheels, yokes, draught-poles, elements of the harness and the headband, bronze ends to axis, «shoes» for attaching a draught-pole to the body, linchpins for fixing wheel on the axis, decorations of yokes and harnesses, bells, tips of the crossbar-yoke. Imitations are also accompanied by burials of people, horses and related inventory in different combinations.

In Early Zhou time, a special kind of chemakyns appears: with long corridors, branching out from the central pit (Chzhantszyaopo, no. 157), as well as long and narrow grave pits only fitting for sacrificial horses (Tsyguchen), only chariots (Lougan, Lyulihe in Fig. 127-131), but most often, chariots with draught animals.

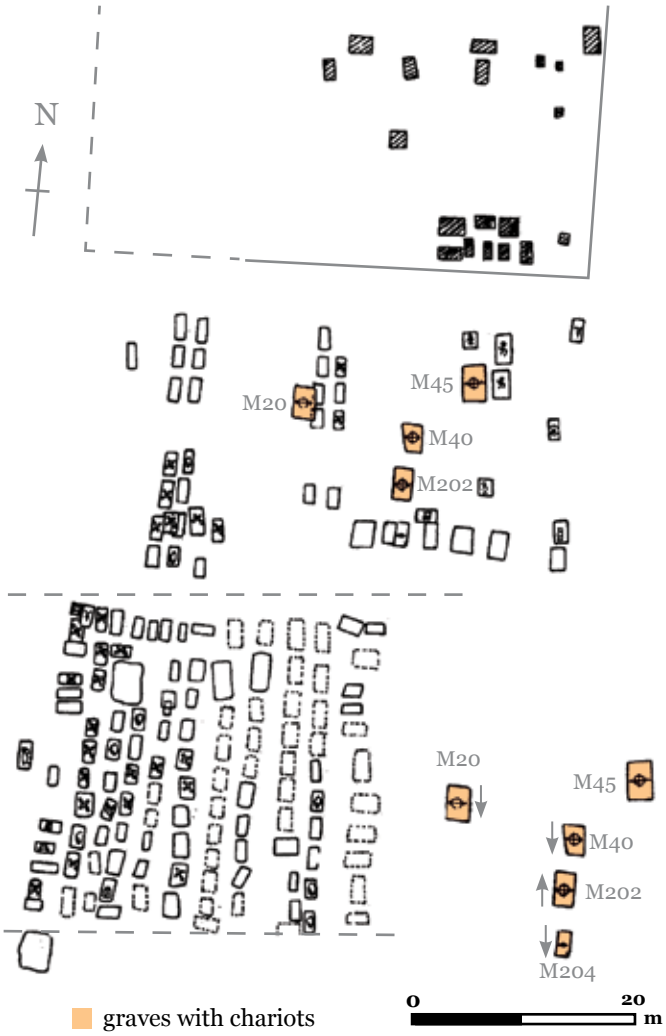


Fig. 110. The general plan of the Xiaotun necropolis (Shang). [Wu, Hsiao-yun, 2009, p. 105].

Let us consider the chemakyn no. 1727 from Shantsunlin in Henan Province (Fig. 114:1). It is a rectangular pit 15.1 x 3.82 m and 1.1-1.3 m deep, with five chariots and 10 horses. Chariots were arranged in a row, draught-poles turned northwards. Pairs of horses were placed under each chariot; skeletons of dogs were found under the platform of vehicles no.3 and no.5. All chariots are of the same type and similar in technical parameters. By design, these Shantsunlin chariot are similar to those of Shan-yin, but smaller. The body is shifted forward in relation to the axis, the body railings are much stronger and more reliable, there is a special barrier-support. The Early Zhou chemakyns have no human burials; pits with chariots are usually next to the graves with rich inventory.

A special type of graves is represented in materials of the mound 3 of the Tszyunuy-dun burial ground, with large collective burials, accompanied by diverse inventory, the chariot weapon complex and the chariot imitations [Wu, Hsiao-yun, 2009, p. 68].

During the Zhanguo period, long rectangular pits were filled with tens of chariots were of different types and sizes, with harnessed horses (Fig. 129), and this trend continued later in the terracotta army of the Emperor Qin Shi Huang.

A few words about positioning of horse bodies in the graves: most often they are placed back to back and on both sides of the draught-pole, as in bigas and quadrigas. This placement should be considered as principal in the funeral rites with real chariots typical to the Shang-Yin period. This tradition persisted in subsequent periods, but new versions appear already in the Western Zhou period: in graves with chariots (bigas and quadrigas), horses are positioned legs to legs, legs to back (more known in petroglyphs as «one over the other») or placed with gathered legs, as if «standing», on both sides of the draught-pole, when looking on the grave from up. The «imitation» burials and sacrificial pits, horse bodies were placed haphazardly, rather dismembered, by the principle of «pars pro toto» (Fig. 121:3, 4). ■

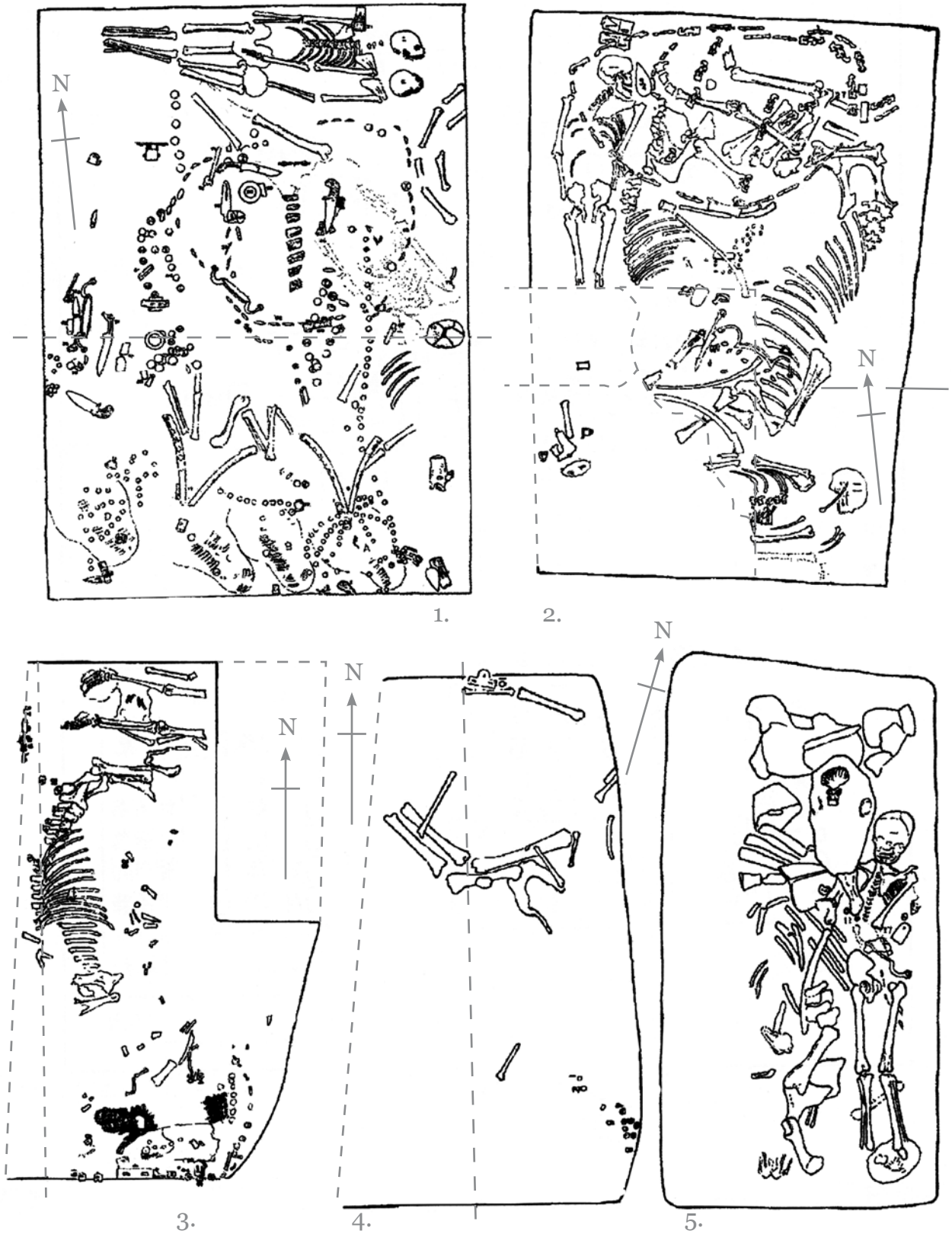


Fig. 111. Xiaotun. Chemakyns: 1 – M20; 2 – M40; 3 – M202; 4 – M204; 5 – M614. [Wu, Hsiao-yun, 2009, p. 106].

Fig. 112. The general plan of the Shantsunlin. Western Chzou. [Wu, Hsiao-yun, 2009, p. 148].

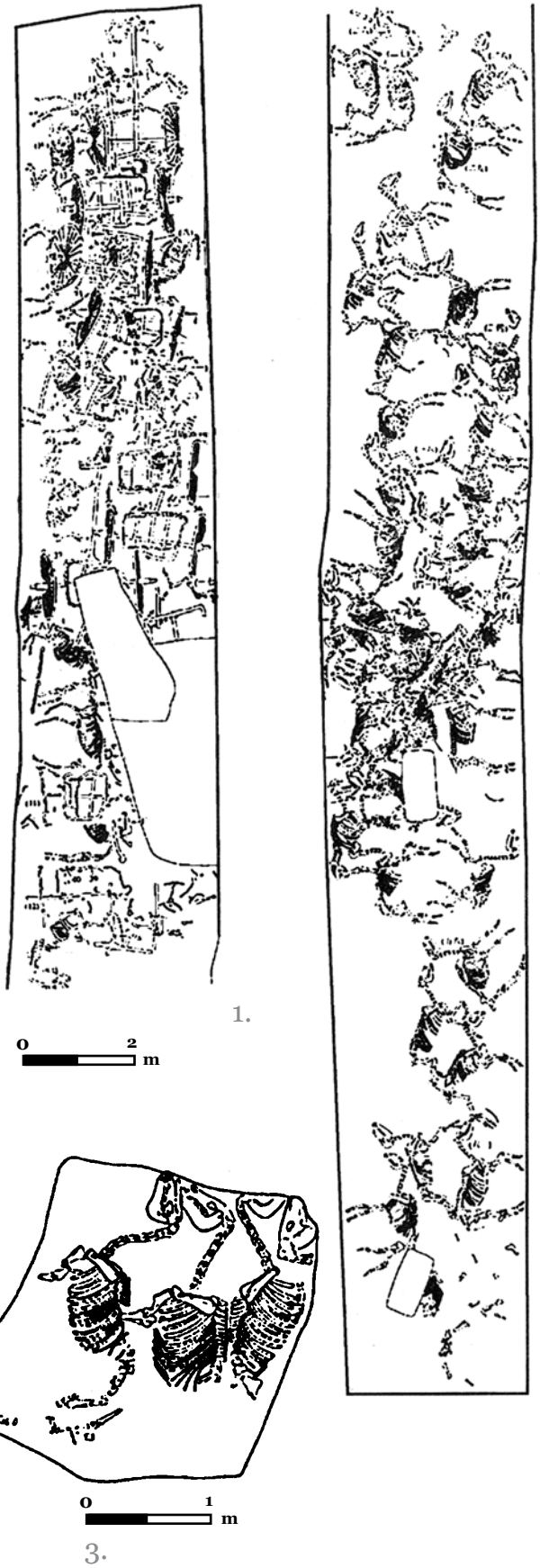


Fig. 113. The cemetery Shantsunlin. Chemakyns from the northern part of the cemetery. (Burial of Hugou): 1 – M2001SNMK1; 2 – M2016MK6; 3 – M2012SNMK2. [Wu, Hsiao-yun, 2009, p. 150].

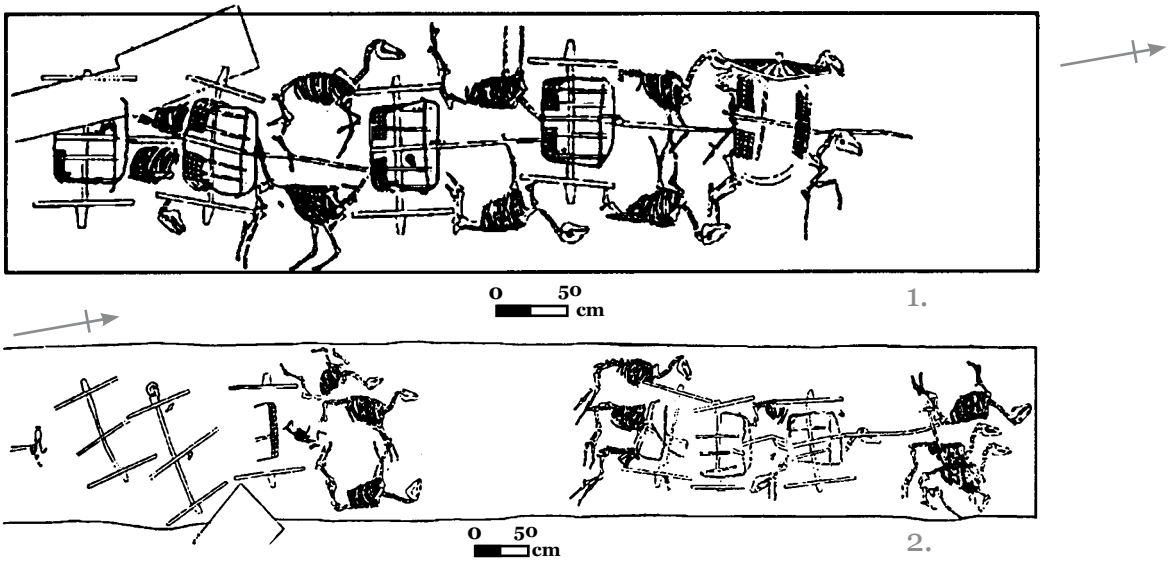
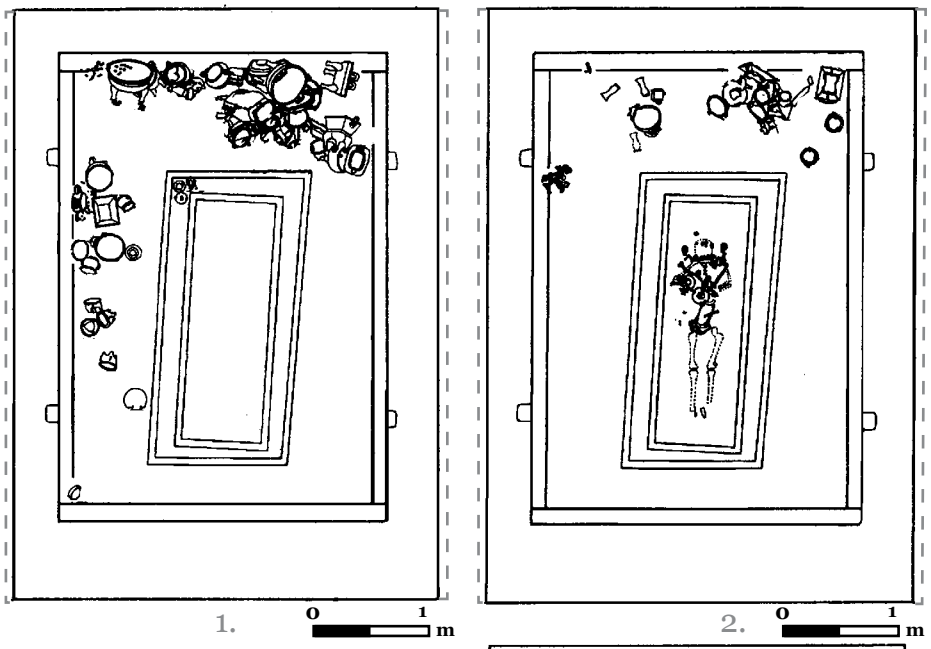


Fig. 114. The cemetery Shantsunlin. Chemakyns from the southern part of the cemetery. 1 – M1727; 2 – M1051. [Wu, Hsiao-yun, 2009, p. 149].



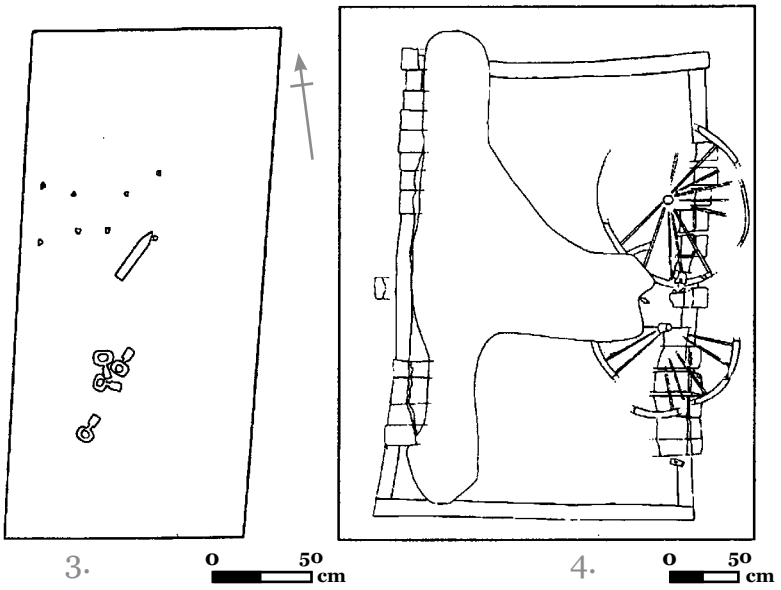


Fig. 115. The cemetery Shantsunlin. Plans of M2012 and M2119. 1 – plan of tomb M2012 – the upper tier; 2 – plan M2012 – the lower tier; 3 – findings on the ceiling of the tomb M2012; 4 – overlapping of wooden tomb M2119. [Wu, Hsiao-yun, 2009, p. 151].

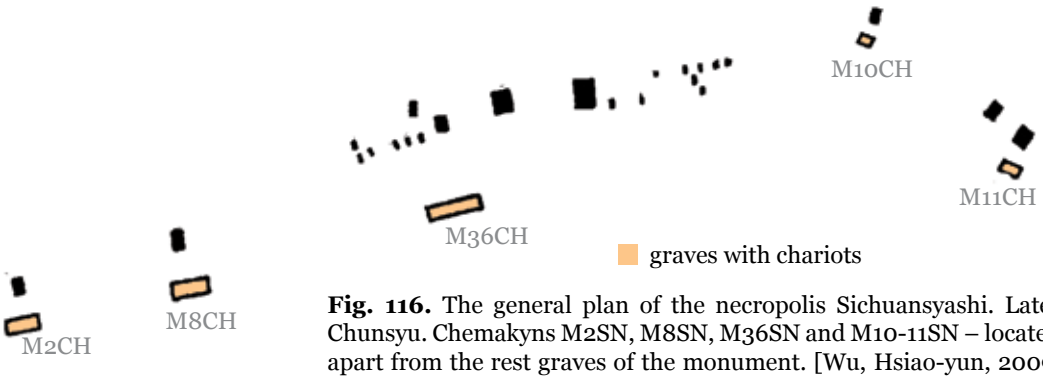


Fig. 116. The general plan of the necropolis Sichuansyashi. Later Chunsyu. Chemakyns M2SN, M8SN, M36SN and M10-11SN – located apart from the rest graves of the monument. [Wu, Hsiao-yun, 2009, p. 164].

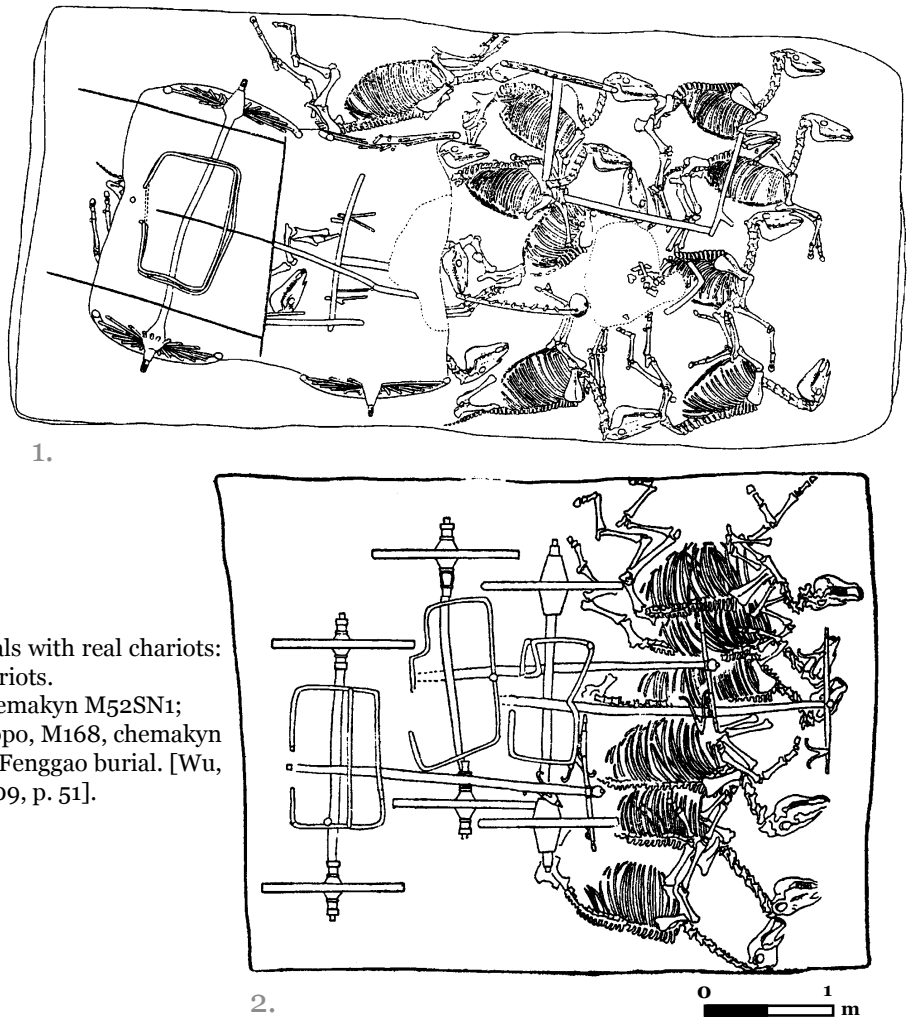


Fig. 117. Burials with real chariots: horses and chariots.
1 – Lyulihe, chemakyn M52SN1;
2 – Zhantszyaopo, M168, chemakyn number 2; 3 – Fenggao burial. [Wu, Hsiao-yun, 2009, p. 51].

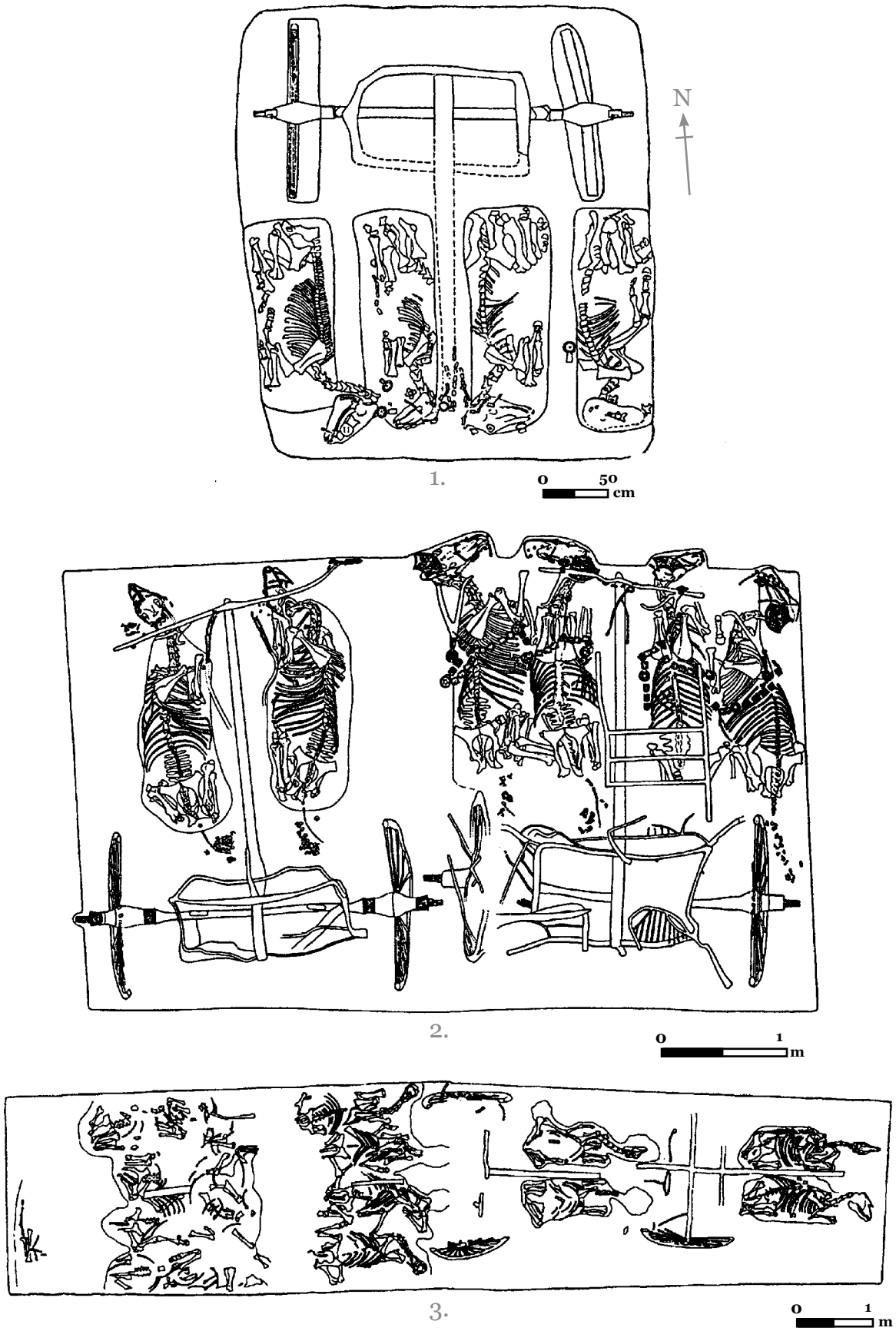
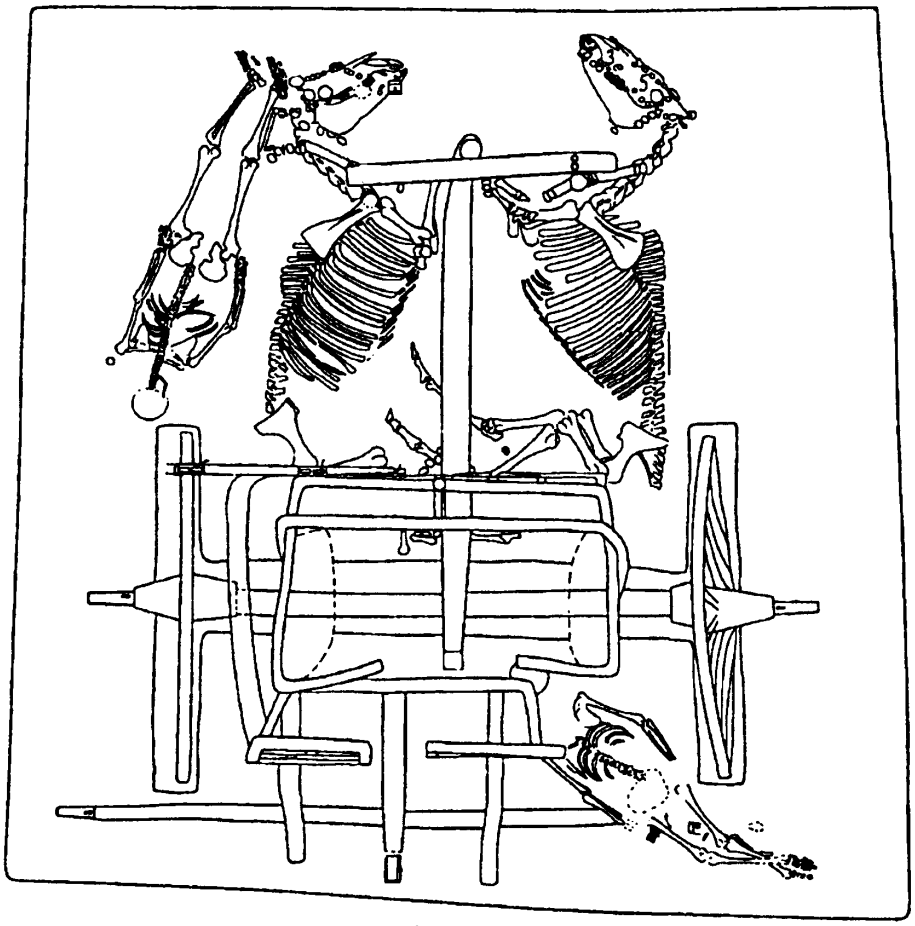


Fig. 118. Burials with real chariots: horses and chariots. 1 – burial Tyanmatsuchun, Zone J4, № 2; 2 – cemetery Zhantszyaopo (Zhutszyazhuan), № 3; 3 – Mausoleum of Shanma, № 2. [Wu, Hsiao-yun, 2009, p. 53].



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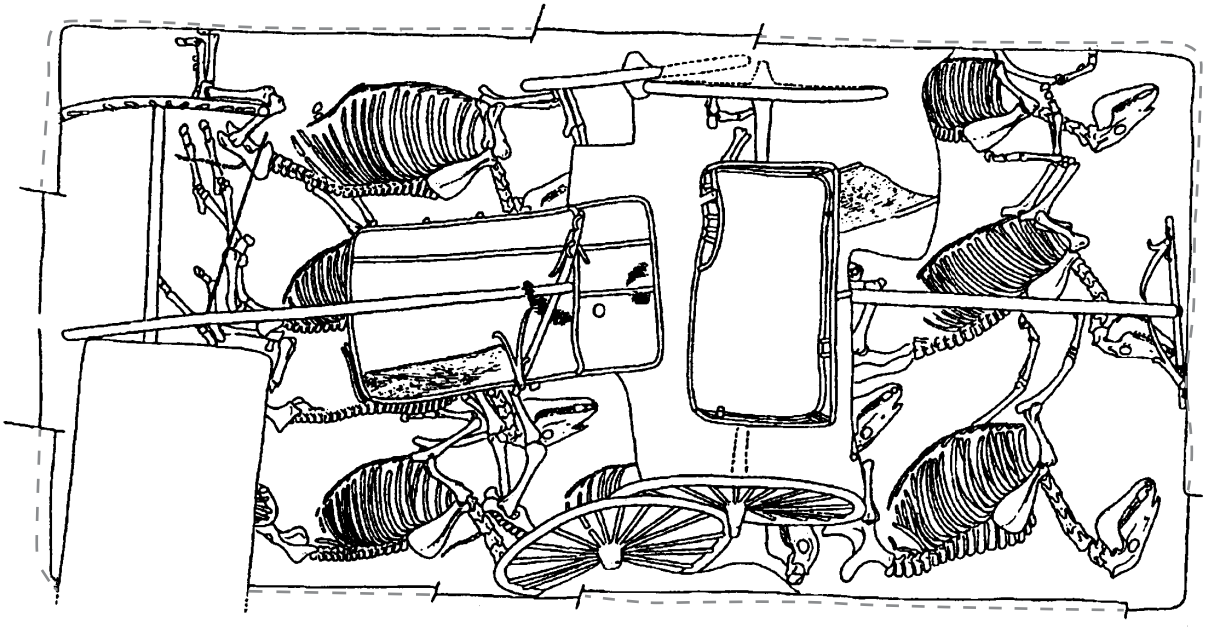


2.

Fig. 119. Burials with real chariots: people, horses and chariots dismantled. 1 – Meiyuanchzhuan, M40; 2 – Tyanmatsuchun, Zone J4, № 3. [Wu, Hsiao-yun, 2009, p. 54].

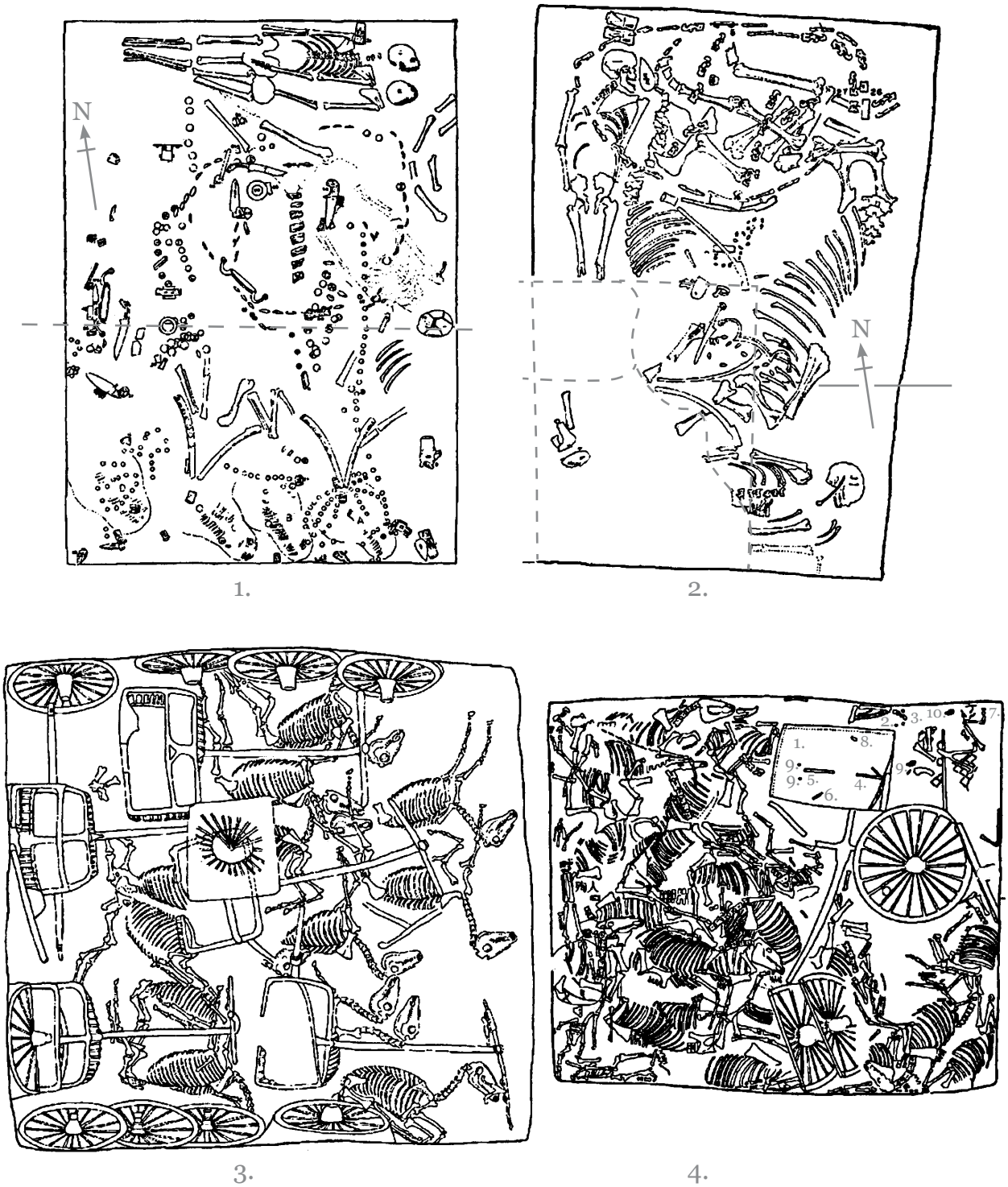


Fig. 120. Burials with imitation: the parts of chariots, horses and humans. 1 – Xiaotun, M20; 2 – Xiaotun, M40; 3 – Lyulihe, № 1100; 4 – Zhantszyaopo, M155: 1 – painted shield with bronze lining; 2, 10 – bronze psalii; 3, 6, 7 – bronze plaques; 4, 5 – bronze heads (?); 8 – fish's figures from the shells; 9 – plaques from the shells. [Wu, Hsiao-yun, 2009, p. 49].

Fig. 121. Burials with imitation: horses and men. 1 – Zhantszyaopo, M340; 2 – Beiyao, MC 724; 3 – Laoyunpo, 86XLIII1M30; 4 – Zhantszyaopo, M 153. [Wu, Hsiao-yun, 2009, p. 58].

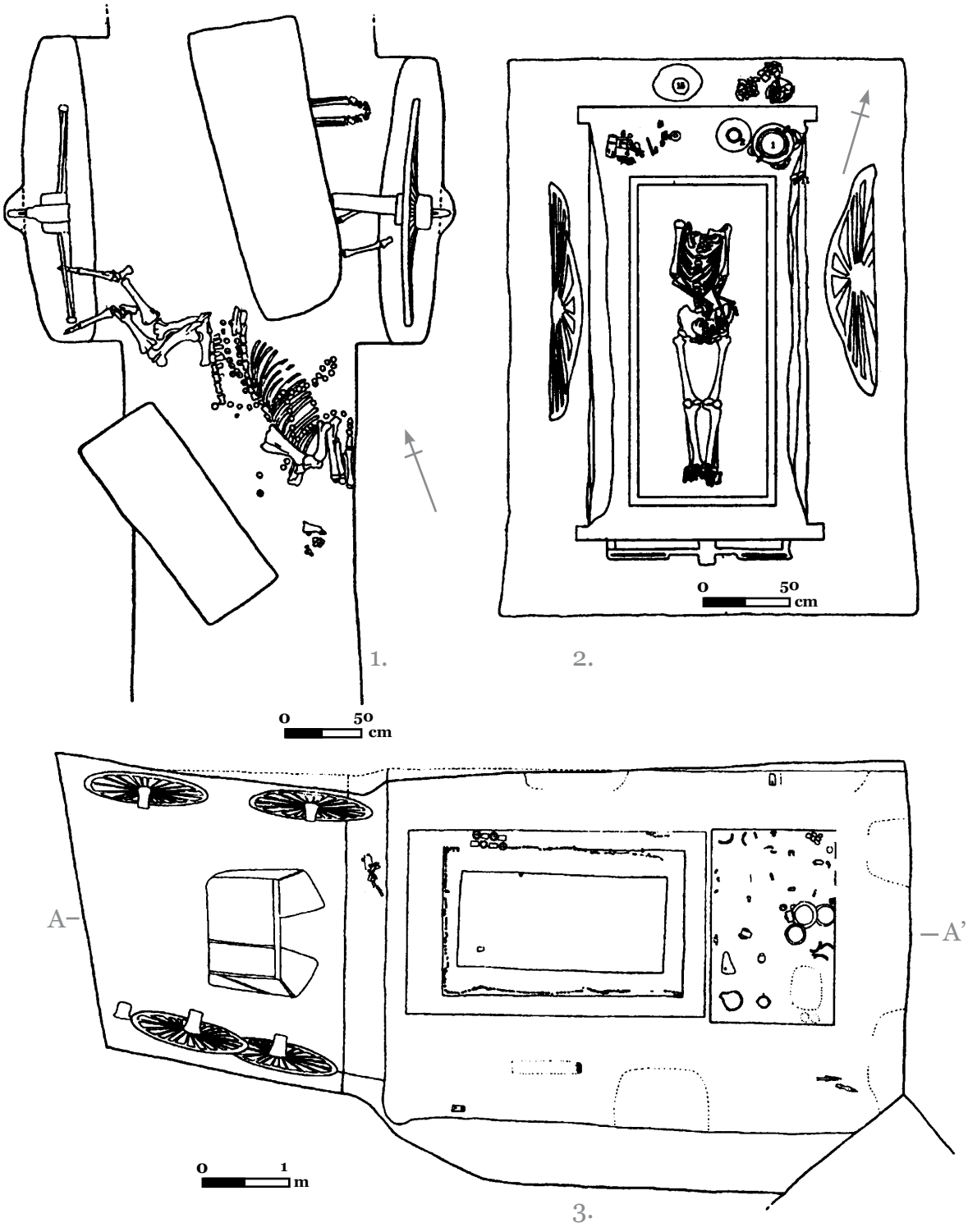


Fig. 122. Burials with imitation: people, horses and chariots dismantled. 1 – Xiaomintun, M698; 2 – Fufenhuantun, M1; 3 – Zhantszyaopo, M 152. [Wu, Hsiao-yun, 2009, p. 62].

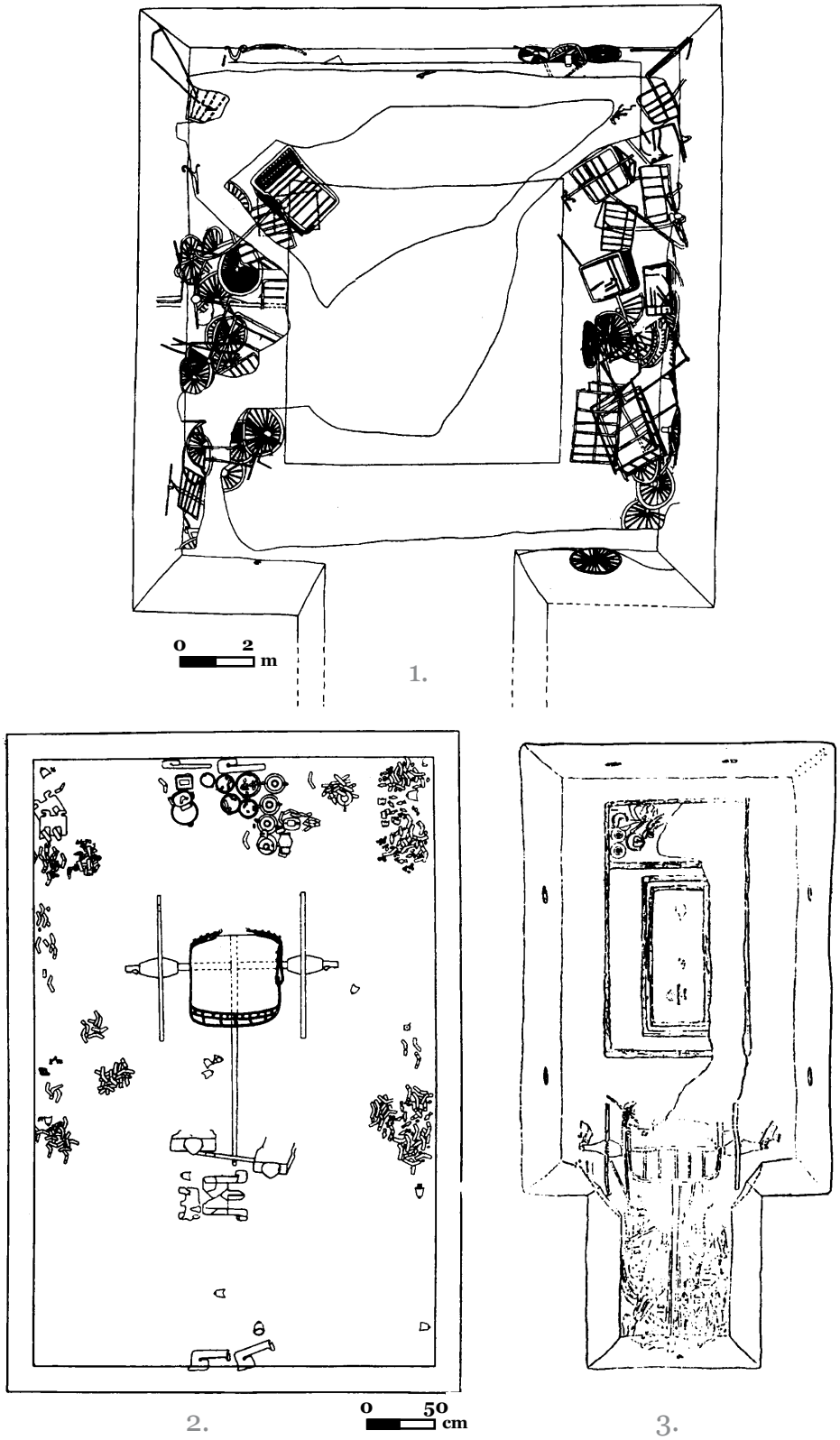


Fig. 123. Burials with chariots: no horses and no people. 1 – Mausoleum Lyuhedyan, № 2; 2 – Bantsyachzhuan, M5 (county Lunsyan); 3 – Pinlyanmaochzhuan, M6. [Wu, Hsiao-yun, 2009, p. 64].

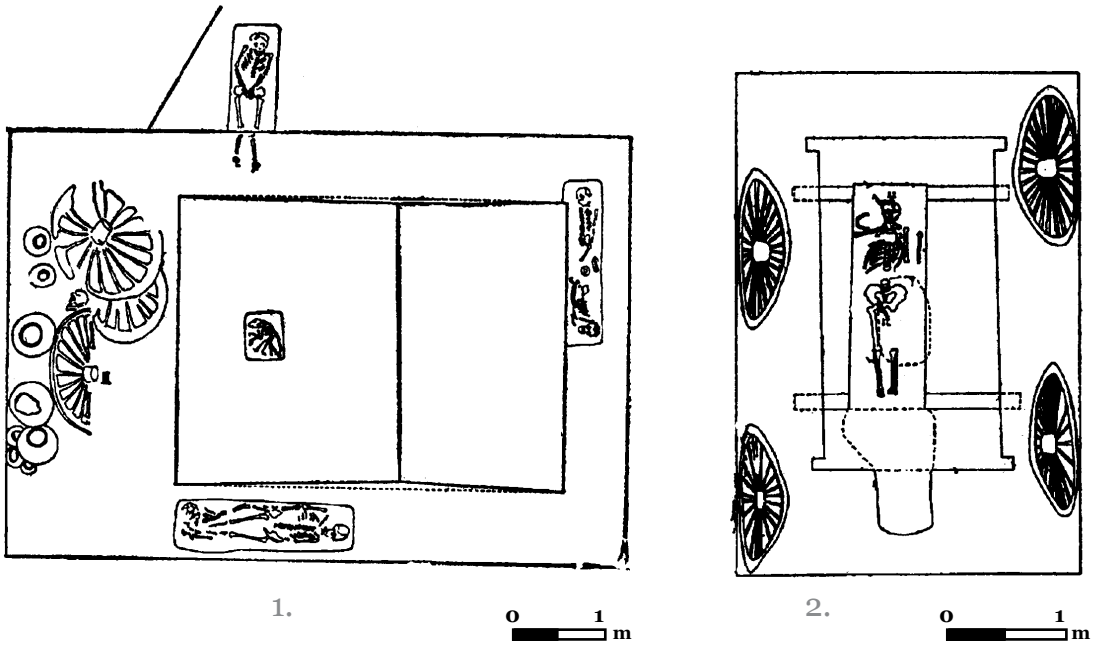


Fig. 124. Burials with imitation: dismantled chariots and people. 1 – Zhutsyachzhuan, BRM1; 2 – Fufenhuantun, M4. [Wu, Hsiao-yun, 2009, p. 65].

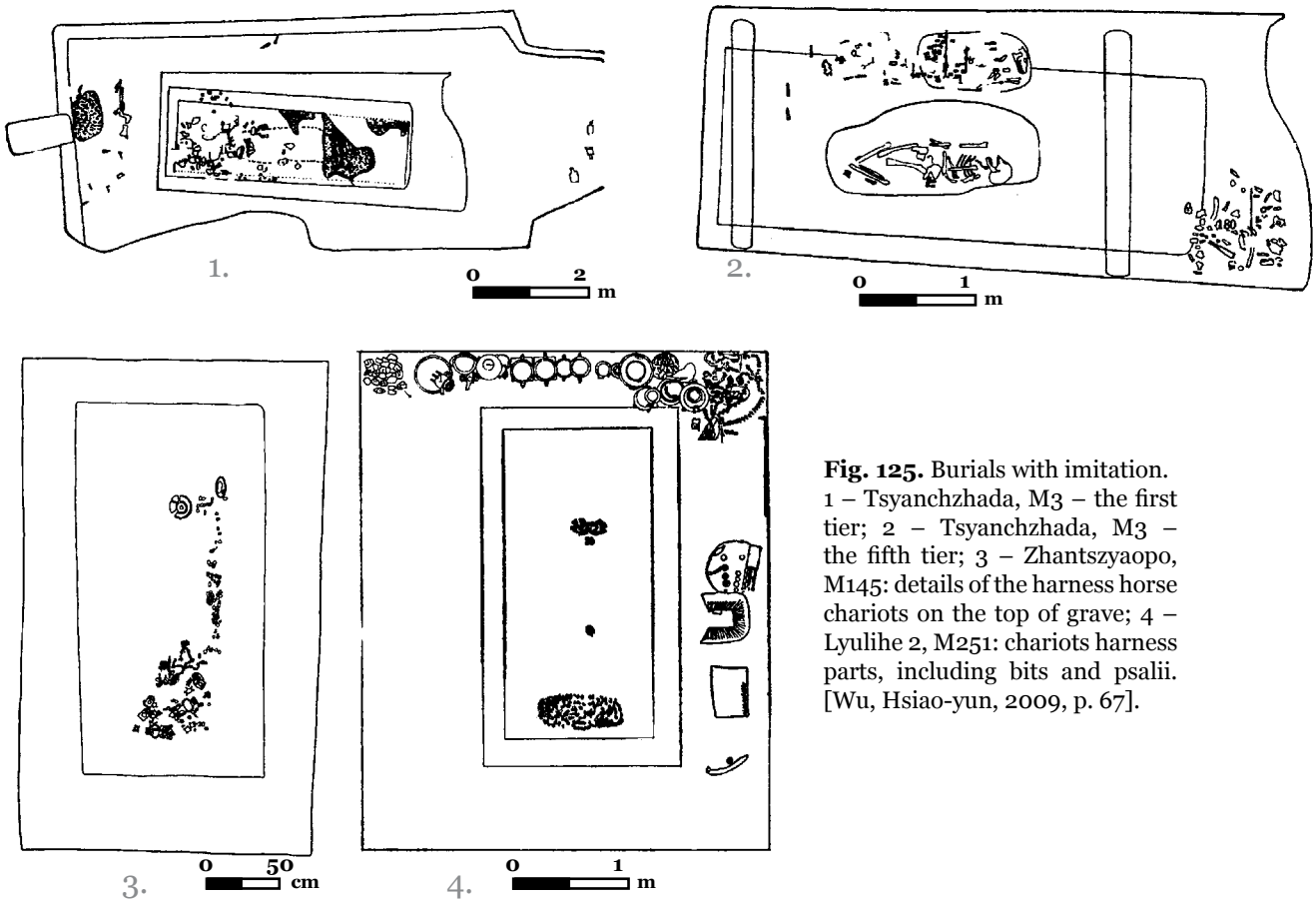


Fig. 125. Burials with imitation. 1 – Tsyanchzhada, M3 – the first tier; 2 – Tsyanchzhada, M3 – the fifth tier; 3 – Zhantszyaopo, M145: details of the harness horse chariots on the top of grave; 4 – Lyulihe 2, M251: chariots harness parts, including bits and psalii. [Wu, Hsiao-yun, 2009, p. 67].

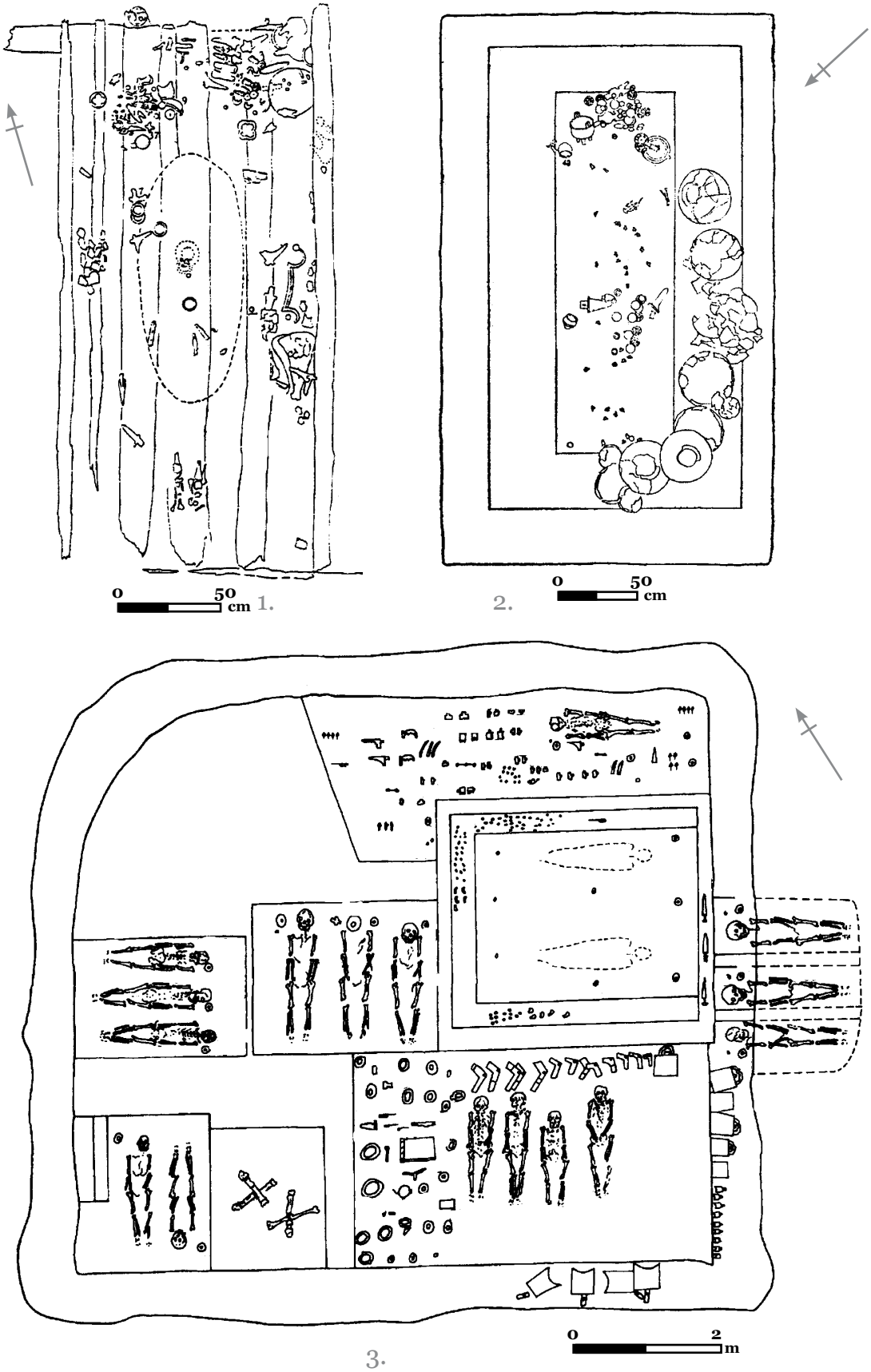


Fig. 126. Burials with imitation: people and parts of the harness. 1 – Bayfu, M3; 2 – Chzhuyangou, grave 3; 3 – Tszyunuydun, barrow 3. [Wu, Hsiao-yun, 2009, p. 68].

Classification of the chemakyn chariots

A large series of already fixed and carefully cleared grave chariots allowed with a high degree of reliability to imagine the evolution and construction details and also to differentiate types of the carriage (Fig. 132-140).

A. Single seat chariots. The body space allows accommodating one standing charioteer. These are horse pair carriages with a small round «D»-shaped or rectangular platform, often with a low side walls. Single-seat chariots of the first type were always harnessed by a pair of horses, whose power was quite sufficient for a speedy drive. Managing such a vehicle required serious skills as a charioteer had no additional support while driving, except for stretched reins. He had to balance on the chariot axis, using tension of the reins and constantly leaning back, thus trying to take a firm stand on the platform and to have somehow hands free to use weapons. Therefore, not accidental are discovery of a special device for fixing a foot, marked on the chariot platform from Gotszyazhuan M52 (Fig. 144:17), and of «yoke models» attached to his belt, which enabled to keep the stability during the motion and release hands from the reins. Maybe, reins were simply tied to his belt, as did the Egyptian pharaohs, to manage a chariot by turning own torso. The wheels of the chariot were about one meter in diameter, with a wide nave. Draught force was transmitted through a direct or slightly curved draught-pole, a yoke crossbar with attached saddle-yokes. It is possible, that triangular stretch leather belts were used in points for fastening the draught-pole to the yoke-bar and for fastening the axis to the draught-pole, as shown in the pictorial sources, although remains of such wooden/leather bracers were not recorded in the Chinese tombs. In general, this type of single-seat chariots seems to be the most archaic of all the chariots complex. It has two subtypes:

1.1. The body of round or «D» shape in plan. Found in the Shang-Yin monuments of Tsyaobey, Gotszyachzhuan, M1003; almost not known in Western Zhou time; was recorded its modified form of the late Chunsyu period (Tszingou, the tomb of Zhao Qing, M251, Fig. 132) with the higher side walls and a front rail, and in the late Warring States period (Matszyayuanchzhuan, no. 4, Fig. 132).

1.2. The body of rectangular shape in plan. Chariots of the subtypes originate from the Shang-Yin monuments of Gotszyachzhuan, M52, Meyyuanchzhuan, M41, Dasykuntsun, M175 (Fig. 133, 143, 144) and were not recorded in subsequent periods.

2. Dual seat chariots, appearing evidently in the end of the Shang-Yin period, become the most popular type of chariots in the Western Zhou time. Their differ principally from the single seat chariots by a larger rectangular or «D»-shaped platform, with a high fence, up to half a meter, while the wheelbase and the yoke-bar decreased in dimensions. The body has a convenient rear exit/entrance opening, a solid front cross handrail of various designs. With the area not exceeding one square meter, the body is well sufficient for two persons. The handrail (up to 90 cm in height) at waist level is fixed by a special cross-piece attached to the draught-pole and is made in several design options. The body is soon provided with a partition, which divides it in two parts (Tyanmatsuchun, J4, no. 3). In the late Chunsyu period, the high front cross handle rail is now positioned along the axis,

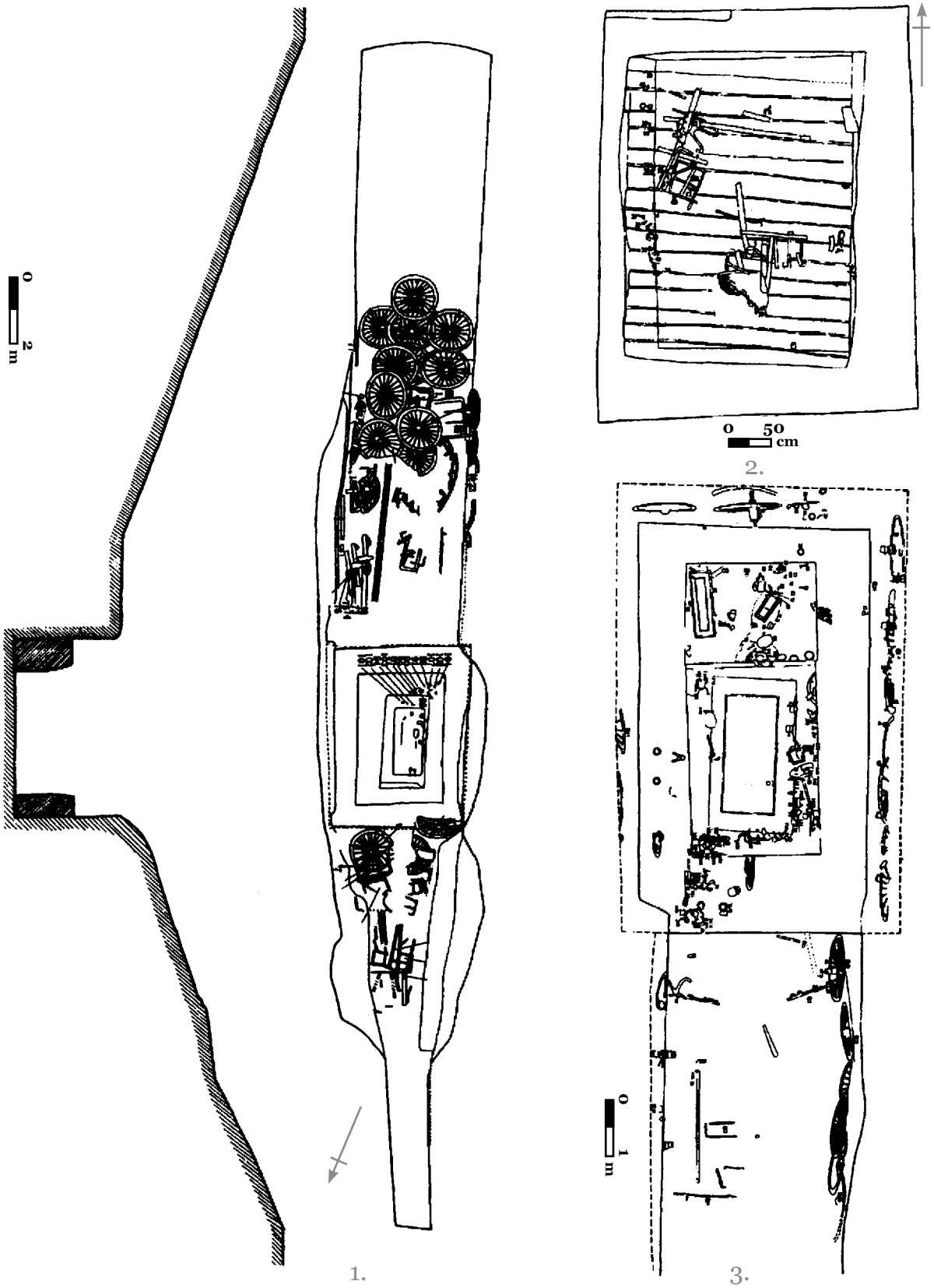


Fig. 127. «The corridor» tombs of the cemetery Zhantszyaopo. 1 – chemakyn M157; 2 – a plan covering of the central grave M157; 3 – chemakyn M170. [Wu, Hsiao-yun, 2009, p. 127].

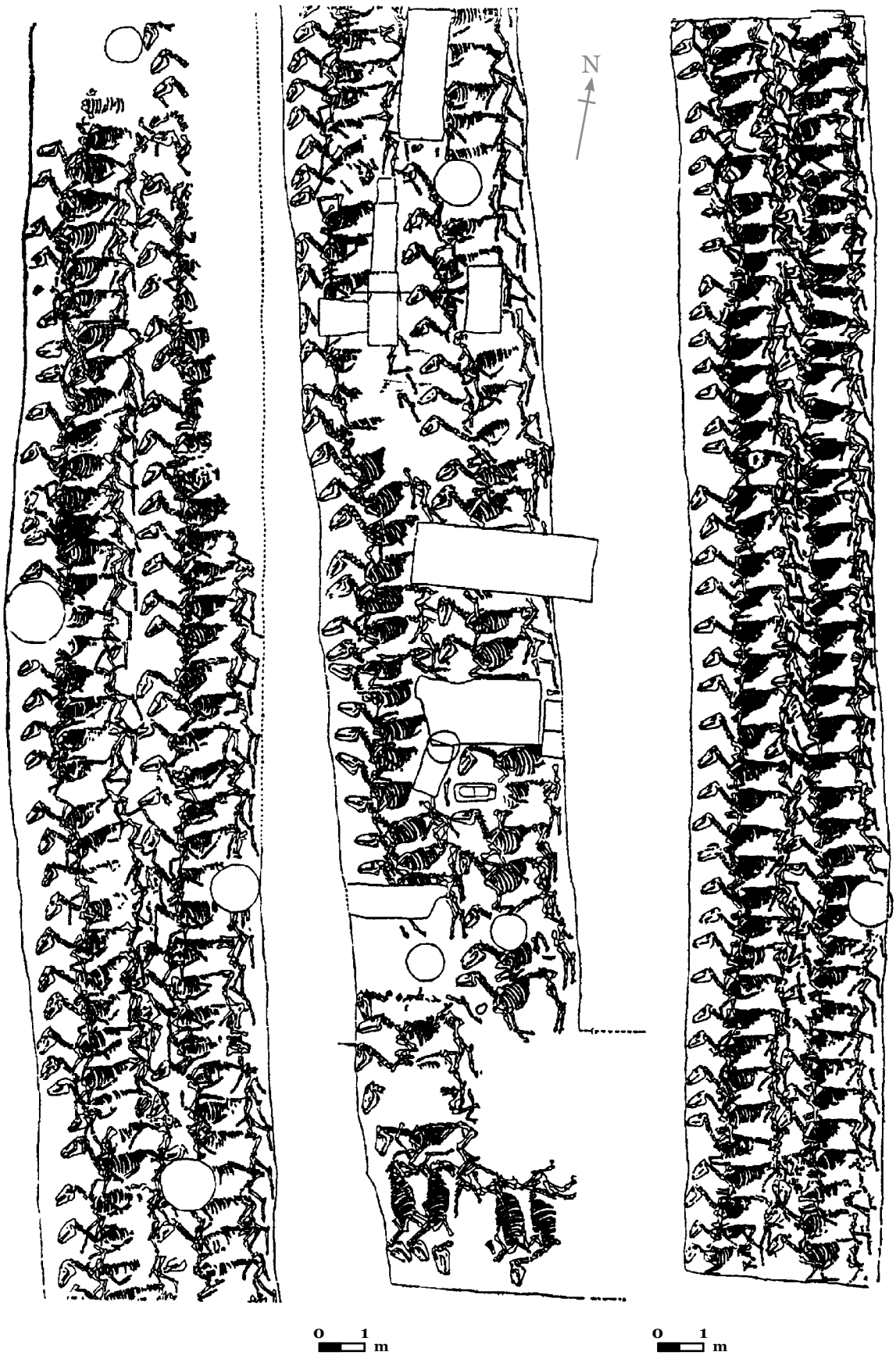


Fig. 128. The sacrificial pits with horses. The cemetery Tsiguchen, pit 5. [Wu, Hsiao-yun, 2009, p. 59].

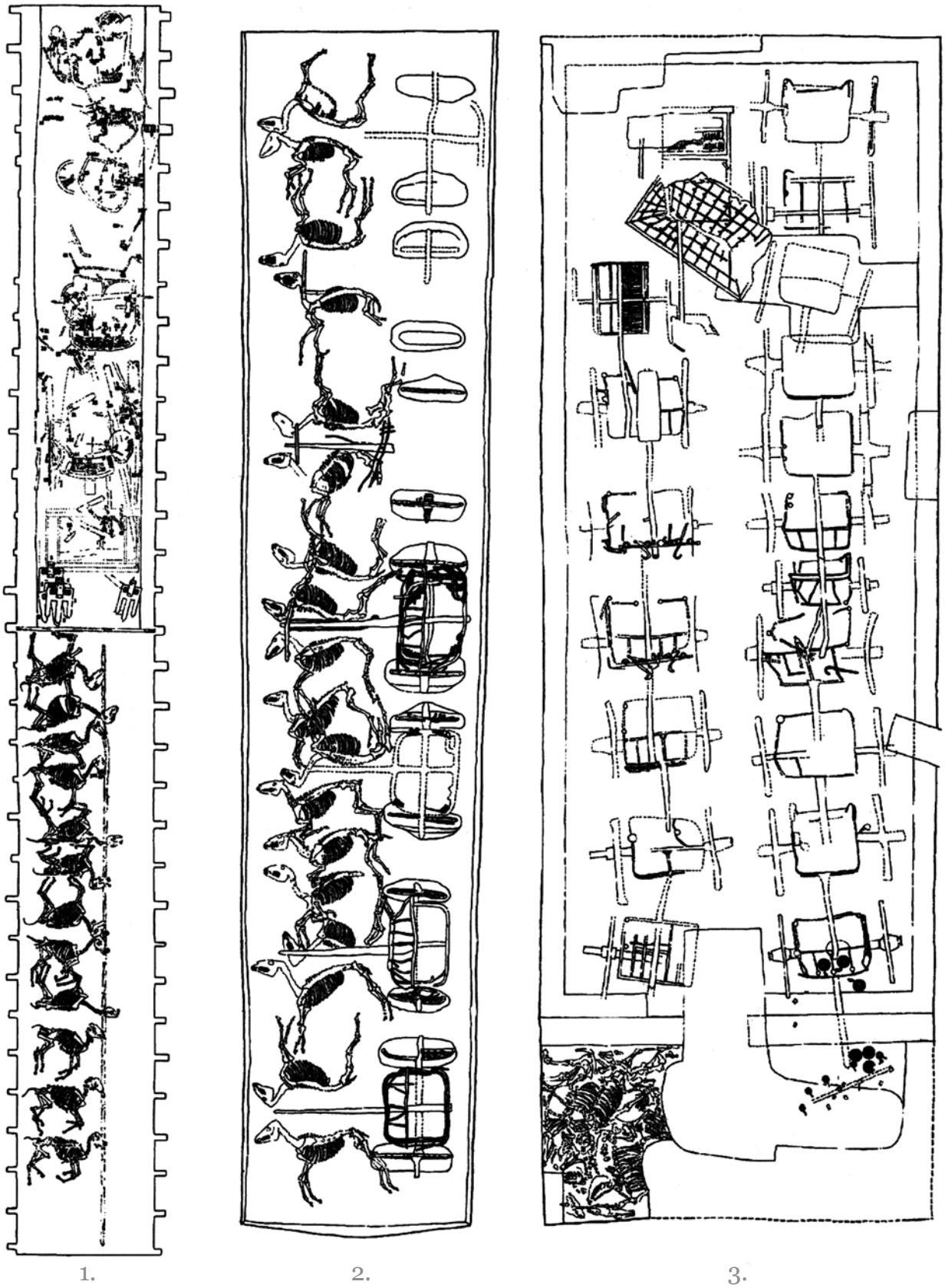


Fig. 129. Chariot's burial without people. 1 – Tomb Chzhunshan Wan, № 2; 2 – Lougan, M1SN (Ichen), Hubei Province; 3 – Lyulihe cemetery, county Huysyan. [Wu, Hsiao-yun, 2009, p. № 80].

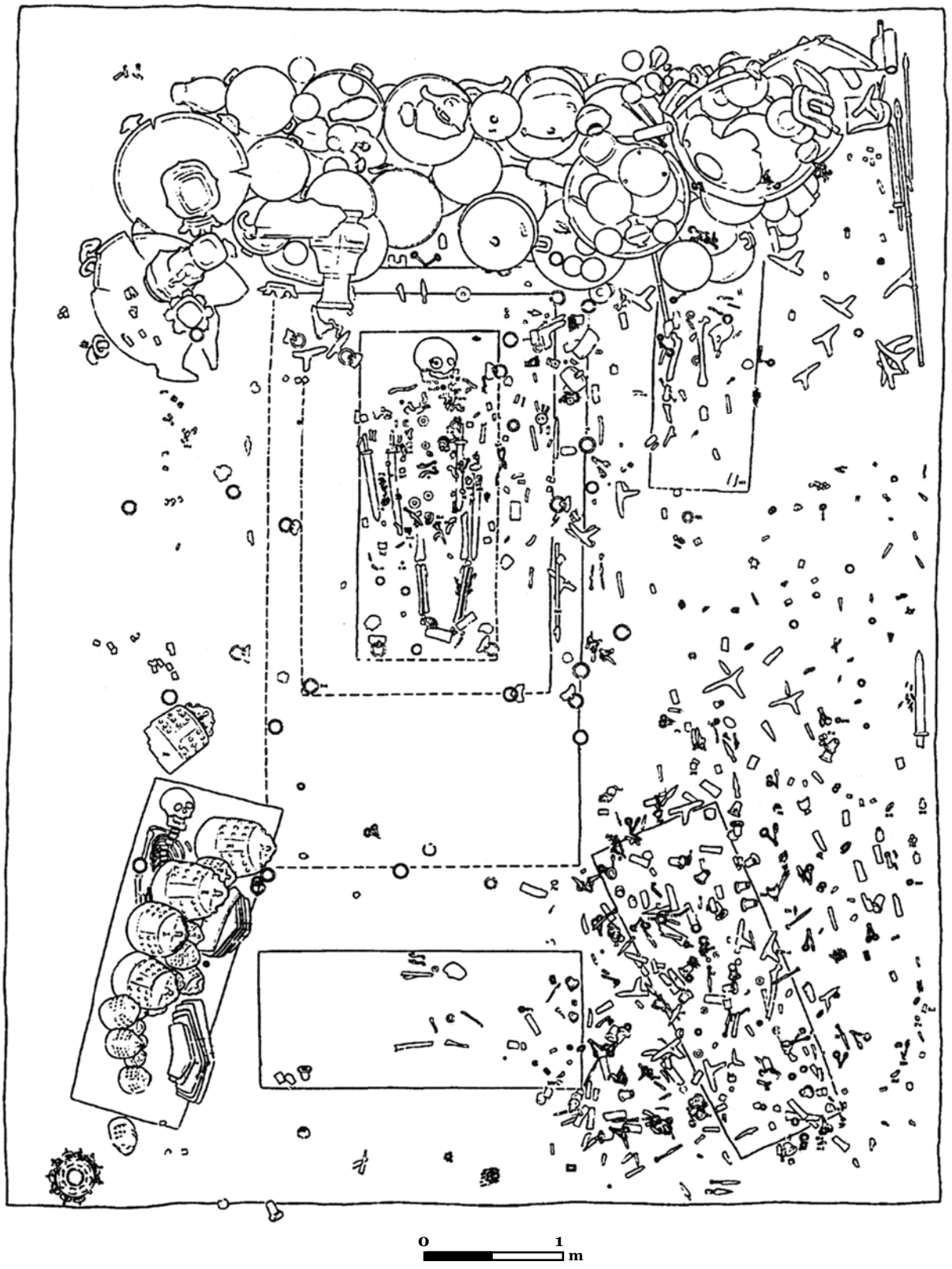


Fig. 130. Tomb of Zhao Qing. [Wu, Hsiao-yun, 2009, p. 160].

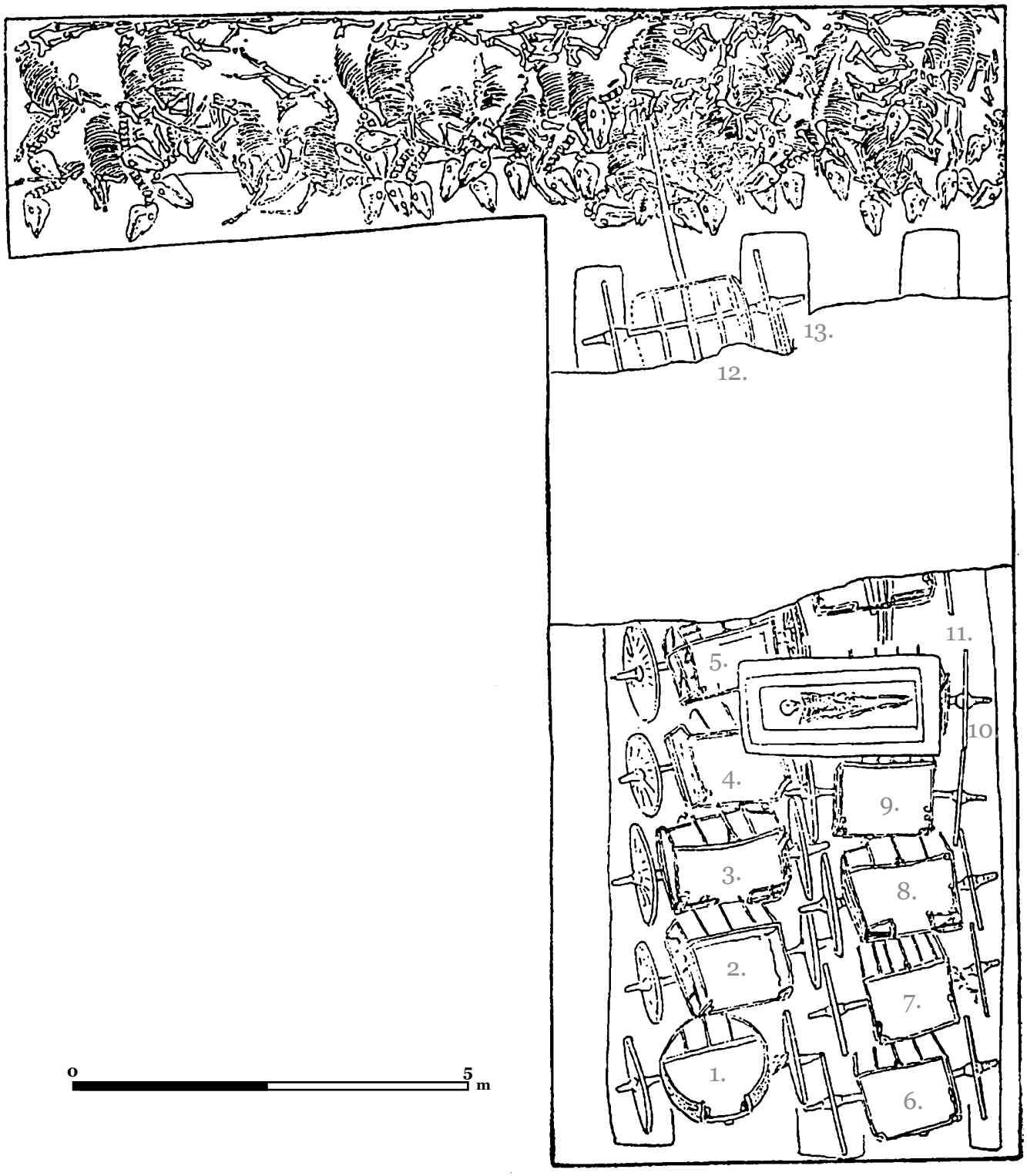


Fig. 131. Tomb of Zhao Qing. The burial of horses and chariots, near to the grave. [Wu, Hsiao-yun, 2009, p. 161].

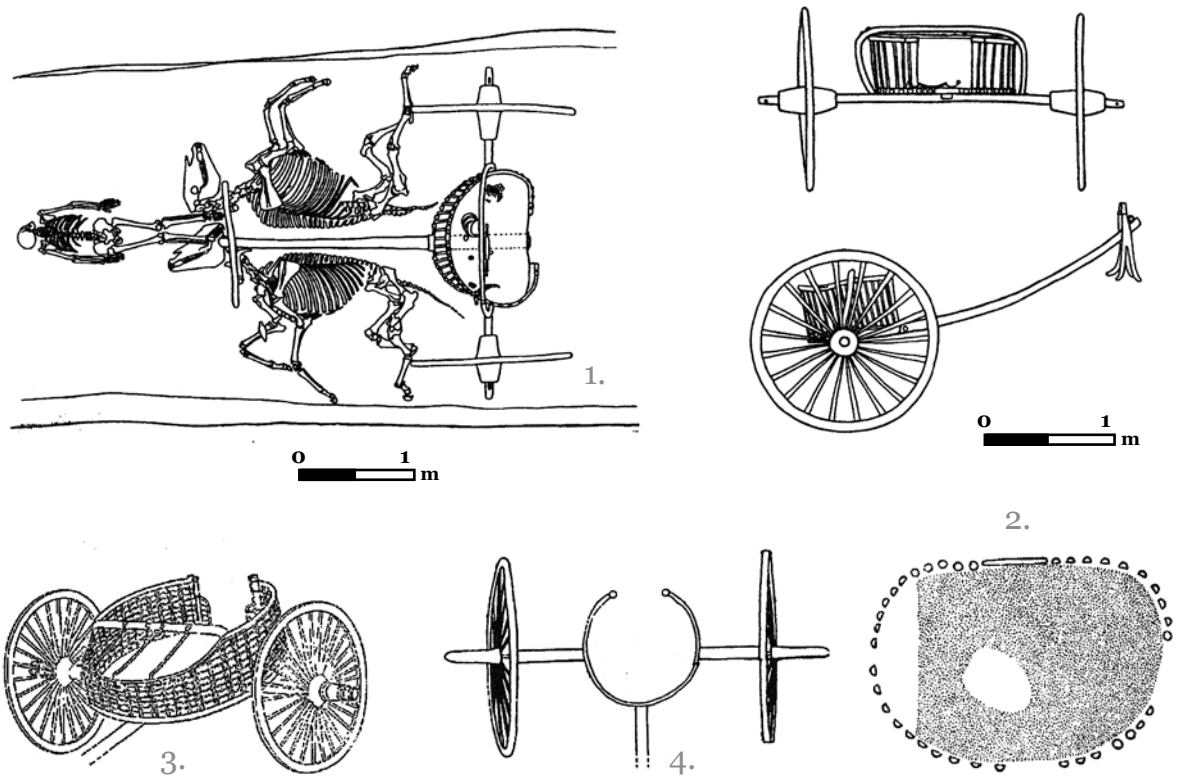


Fig. 132. Typology. Chariots with the little round platform. 1 – Tsyaobey (Shang); 2 – Gotszyachzhuan (Shang), M1003, the remains of the body; 3 – tomb of Zhao Qing (Tszingou), M251, № 1 (later Chyunsyu); 4 – Matszyayuan, № 4 (later Chango). [Wu, Hsiao-yun, 2009, p. 22, 23].

dividing it in halves (the tomb Shanma, no. 3, Fig. 135). In addition to the two-horse teams, trigas and quadrigas are beginning to be in use. The latter's design allows compensating an increased mass of the vehicle, maintaining the high speed. The draught-pole system did not undergo significant changes: the draught-pole has a hook at the front end to grab the yoke bar securely; the draught-pole is more curved or double bent. In use are traces and the improved headband and control system. The design takes into account shortcomings of the previous chariot types, driving them becomes more comfortable thanks to the front cross handle rail, to which reins could be tied, or fasten horses and yourself by the waist belt, and to rely on potholes and sharp turns. Therefore, this crucial rail is reinforced by various braces connected to the draught-pole for a stronger binding of the whole body structure (Fig. 136). New are bronze fittings, securely fastening together the most vulnerable design units: junction of the draught-pole with the yoke bar, on one side, and with the axle and the body, on the other. Stable fixation of wheels to the axis is provided by bronze tops put on both sides of wheels. From outside, the wheels are secured with bronze linchpins. But most important in these chariots is a two-person crew, which allowed one to specialize in driving the chariot and the second to focus on use of weapons in the battlefield and necessary protection of the crew. There here are two subtypes:

2.1. The body of rectangular shape, with a front handrail; represented by findings from tombs of the Western Zhou period, in

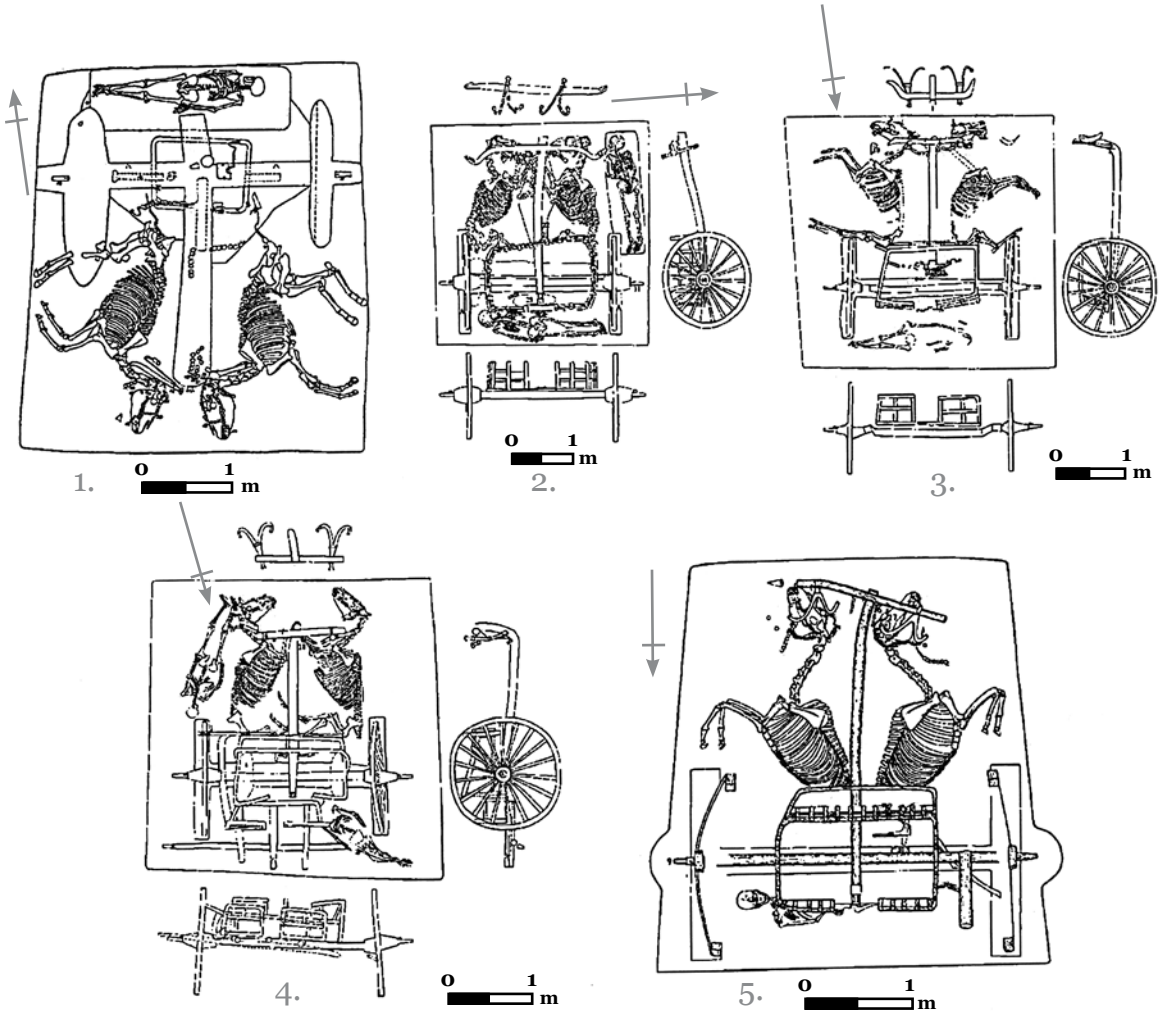


Fig. 133. Typology. Single chariot with a small rectangular platform (Shang). 1 – Dasykuntsun, M175; 2 – Gotszyachzhuan, M52; 3 – Meiyuanchzhuan, M41; 4 – Meiyuanchzhuan, M40; 5 – Tszyanchzhanda, # 131. [Wu, Hsiao-yun, 2009, p. 24].

the monuments: Tyanmatsuchun, M6231, J4 zone; Chzhanzyaopo; Zhuytszyazhuan BRCH 3:1; Shantsunlin, M2001, 1727, during the early and middle Zhang – Logan, M1, no. 4, Lyuhedyan, M2, no. 20; Tszyanlin Tszyudyan M104, no. 2 (Fig. 134).

2.2. The big body of «D» shape and a front handrail. Found in the tomb of Zhao Qing of the Tszingou necropolis of the Late Chunsyu period, in the Chzhushanvan monument, no. 3, of the Middle Zhanguo and others (Fig. 137:5). This subtype is a late modification of the first subtype, expressed in the change from a rectangular to «D»-shape and increase in the dimensions of the chariot.

In general, all Chinese chariots of the Shang-Yin and Western Zhou periods have the body positioned strictly above the axis for a balanced distribution of the gravity center directly on the axis in order, to prevent overthrowing in motion. A slight body shift towards the harnessed animals or backwards were compensated, obviously, by individual skills and balancing of a charioteer. Perhaps, the chariots were built, taking into account the individual physical characteristics and skills of their owners, the design was determined by the degree of professionalism and experience of a charioteer. Practical use was defined by

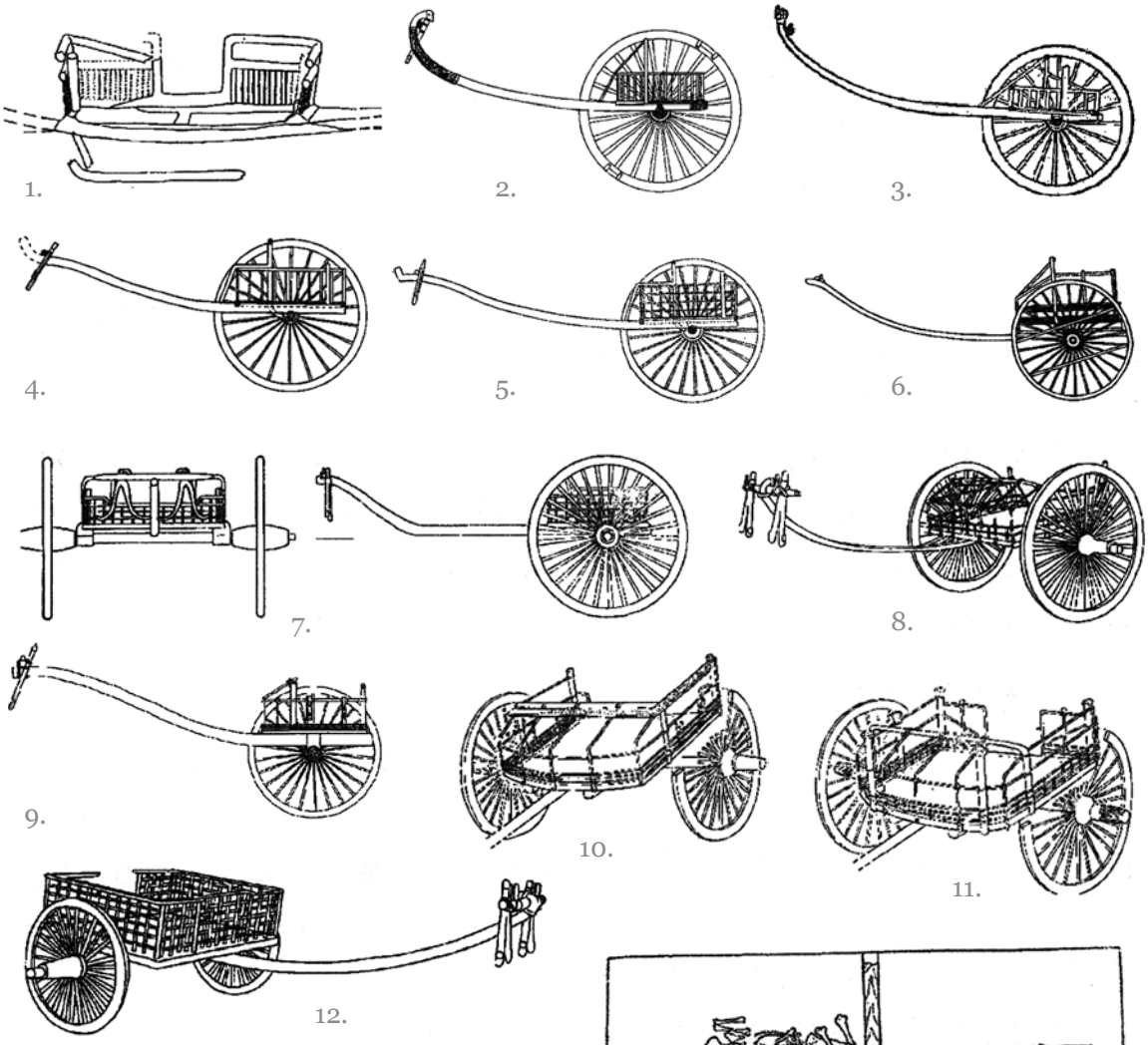


Fig. 134. Typology. Zhou chariots. 1 – Tyanmachuchun M6231; 2 – Zhantszyaopo; 3 – Zhuytszyachzhuan, BRCH 3:1; 4 – Shantsunlin (grave of Fugou) M2001, CHMK1; 5 – Shantsunlin (grave Fugou) № 1727; 6 – Logan (Ichen), M1, № 4; 7 – Shamamudi, chariot 1, chemakyn 3; 8 – Lyuhedyan, M2, № 20; 9 – Tszyanlin Tszyudyan, M104, № 2; 10 – Tszhao Qing, chariot 9; 11 – Tszhao Qing, chariot 3; 12 – Lyuhedyan, chariot 1; 13 – Luoyang sity, street Chzhunchzhulu. [Wu, Hsiao-yun, 2009, p. 27].

the scope of military tasks in the battlefield, objectives in the hunt, by purposes of rituals, funeral ceremonies, and representation missions.

3. Passenger and cargo vehicles. At the heart of the design is a large and solid chariot drawn by two or four horses, set on large, massive wheels with spokes. The front rail is absent. The area of the platform increases up to 2 sq. m and more by lengthening the platforms to the sides of the draught-pole and the axle, while maintaining a standard wheelbase. This upgrade resulted in an increase and thickening of the

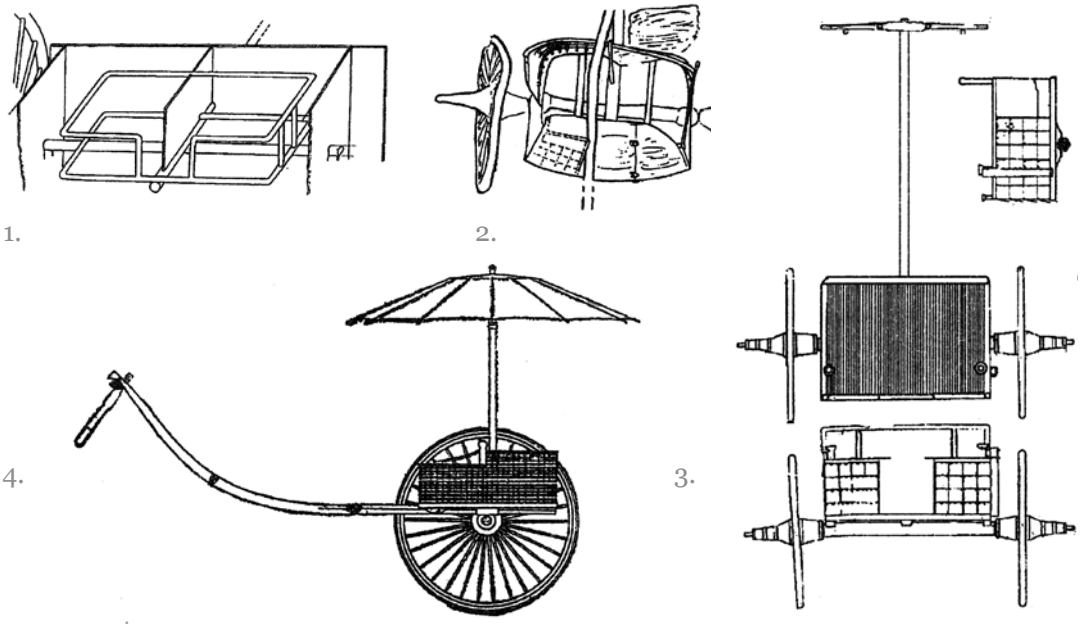


Fig. 135. Typology. Double chariot with a longitudinal septum body, with a cross guard rail and an umbrella: 1 – Tyanmatsuchun, Zone J 4, chemakyn 3, chariot 2 (Western Zhou); 2 – Grave Shanma, chemakyn 3, chariot 4 (late Chunsyu); 3 – Maadzhun, chemakyn 2, chariot 4 (late Zhango); 4 – Pinlyanmaochzhuan, chariot 1 (late Zhango). [Wu, Hsiao-yun, 2009, p. 30].

draught-pole, which for this reason cannot be made much curved. The draught-pole of such vehicles is more direct, which, in turn, dictates an increase in the diameter of the wheels. However, the elongation of the body required preserving the gravity center over the axis and the horizontal positioning of the carriage body against the earth surface. Elongation of the body forward was limited by the format of horses and their physical properties – the ability to walk or gallop – and by the thick shaft, which could not be too long. Significant expansion of the platform could lead to overthrowing and inefficient use of the draught effort of four horse power, as the draught horses were to resist the inevitable lifting force to the detriment of the draught force, which should be directed strictly straight ahead. In view of these reasons, the technical parameters of passenger-cargo vehicles were strictly limited. Vehicles of this type are controlled by a charioteer, sitting or kneeling in the carriage front. The vehicles were used in the military supply strings, in domestic needs to carry loads, in delivery of small military units to battle sites. First recorded were in the Western Zhou period: in the Shantsunlin burial ground, the chariot no.15 from the chemakyn M2012SNMK 2 (a prototype) and in the mausoleum Chzhenchzhouva Liu, no. 3, especially widespread in the Zhanguo period and later survived with minor modifications up to the ethnographic modernity. There are three subtypes:

3.1. A large open rectangular body and a low fence. Found in the burial ground Lyuhedyan 2, no. 11, Chzhenhanguchen, Yuandyanshan 98, LDK1 of the Early Zhanguo period (Fig. 136-137);

3.2. A large rectangular low covered body with low sides, suitable for distribution, e.g., of bronze weapons in the battlefield and in the train: long spears and battle chisel axes, bows and crossbows, arrows to them, or to carry banners; it has inside

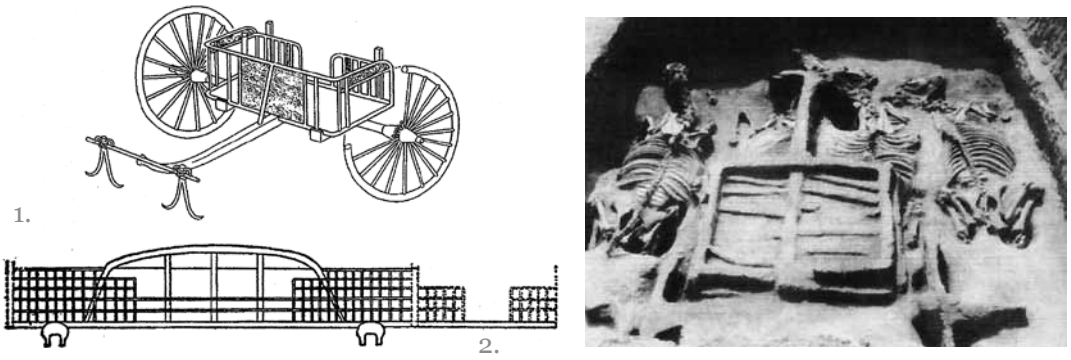


Fig. 136. Typology. Double chariots and cargo vehicle. 1 – Tyanmatsuchun, Zone J 4, chemakyn 3, chariot 1 (Western Zhou); 2 – the mausoleum Shanma, chemakyn1, chariot 1 (Chunsyu); 3 – Mausoleum Chzhendzhouva Liu, chemakyn 2 (Western Zhou); 4 – Mausoleum of Lyuhedyan, chemakyn 2, chariot 11 (Zhango). [Wu, Hsiao-yun, 2009, p. 31-32].

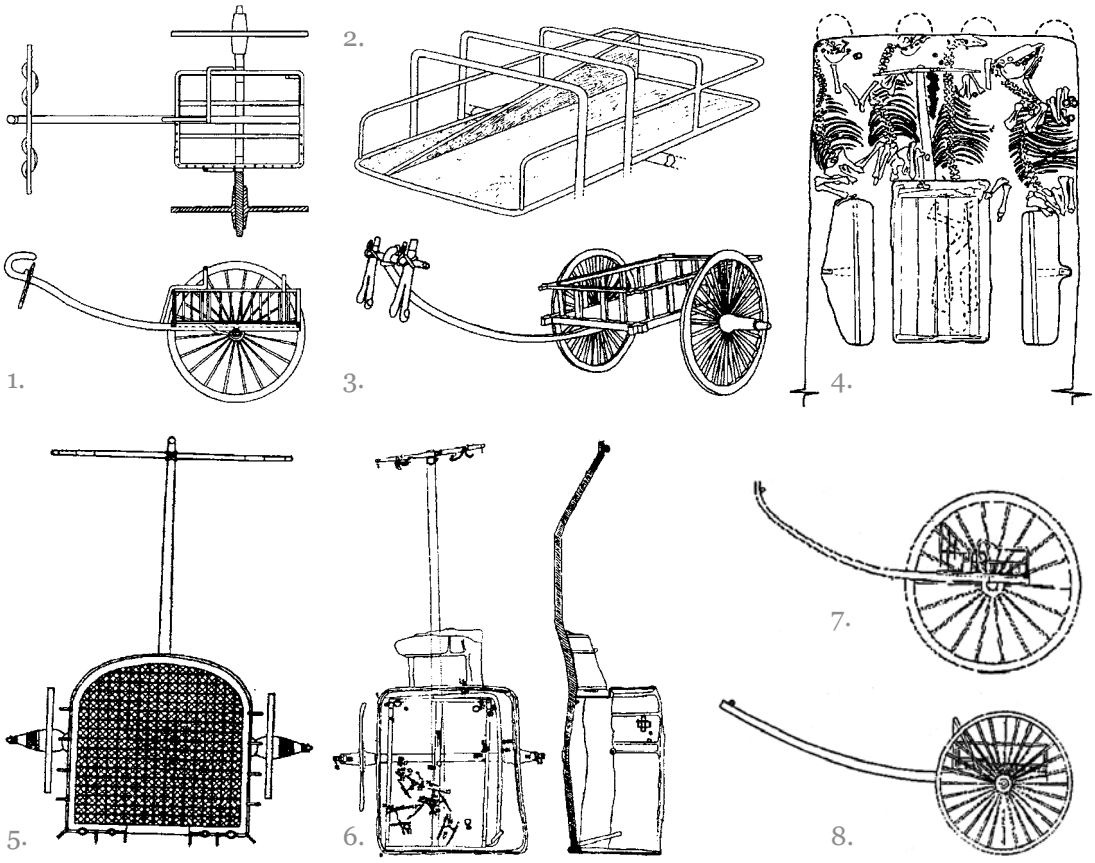


Fig. 137. Typology. Big chariots and small chariots on the «human» cravings. 1 – Shantsunlin (the tomb of Hugo), M2012CHMK2: CH15 (Western Zhou); 2 – Tyanmatsuchun, Zone J 4, chemakyn 3, chariot 2 (Western Zhou); 3 – Lyuhedyan (Cemetery Linlu), chemakyn 2, chariot 11 (early Warring States); 4 – Lixian county, Yuandyanshan 98 LDK1; 5 – Mausoleum Chzhunshan Wan, chemakyn 2, chariot 3 (Middle Zhango); 6 – Maanchzhun, chemakyn 2, chariot 13 (late Zhango); 7 – Bantszyachzhuan, the chariot on the ceiling of the tomb (county Lunsan); 8 – Fensyabatsitun, BS 26 (early Chunsyu). [Wu, Hsiao-yun, 2009, p. 26, 33].

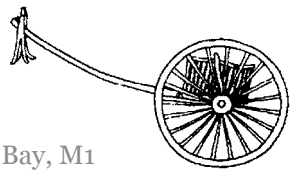
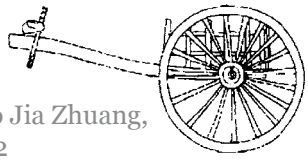
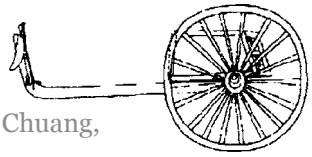
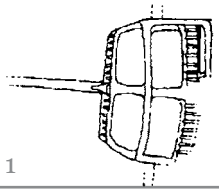
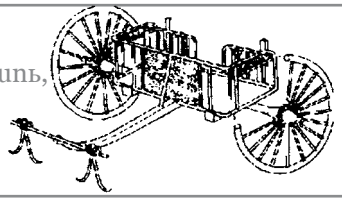
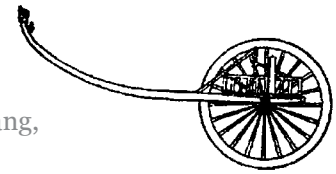
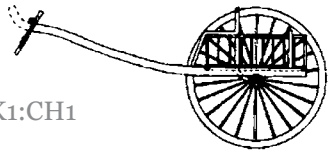
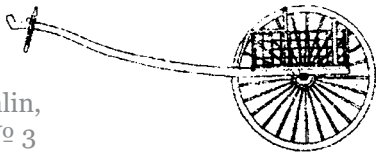
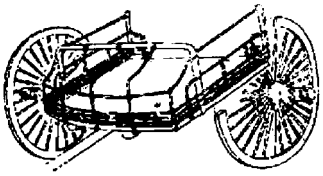
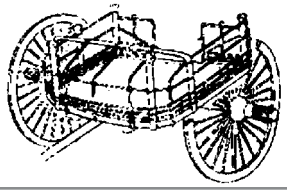
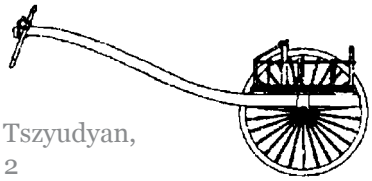
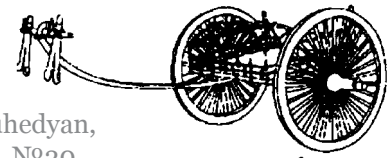
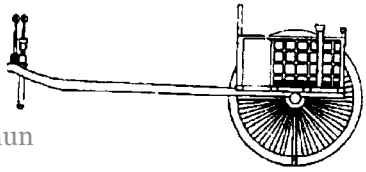
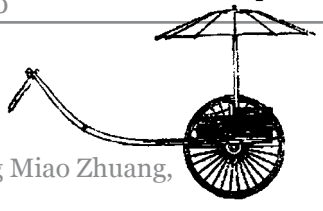
Shang-In'	 Qiao Bay, M1	
Shang-In'	 Guo Jia Zhuang, M52	 Mei Yuan Chuang, M41
West Zhou	 Lyulihe, M 1100, № 1	 Tian matsudzhunь, № 3
West Zhou	 Zhu Jia Zhuang, BRCH 3:1	
West Zhou	 Shantsunlin, M2001CHMK1:CH1	
West Zhou	 Shantsunlin, M1727, № 3	 Fensyanbatsitun, BS26
late Chunsu	 Zhaoqing, №2;	 Zhaoqing, №3
Chzhango	 Tszyanlin Tszyudyan, M104, № 2	 Lyuhedyan, M2, №20
late Chzhango	 Maanchzhun M2, №4	 Pingliang Miao Zhuang, № 1

Fig. 138. Typology and Evolution of Chinese vehicles.

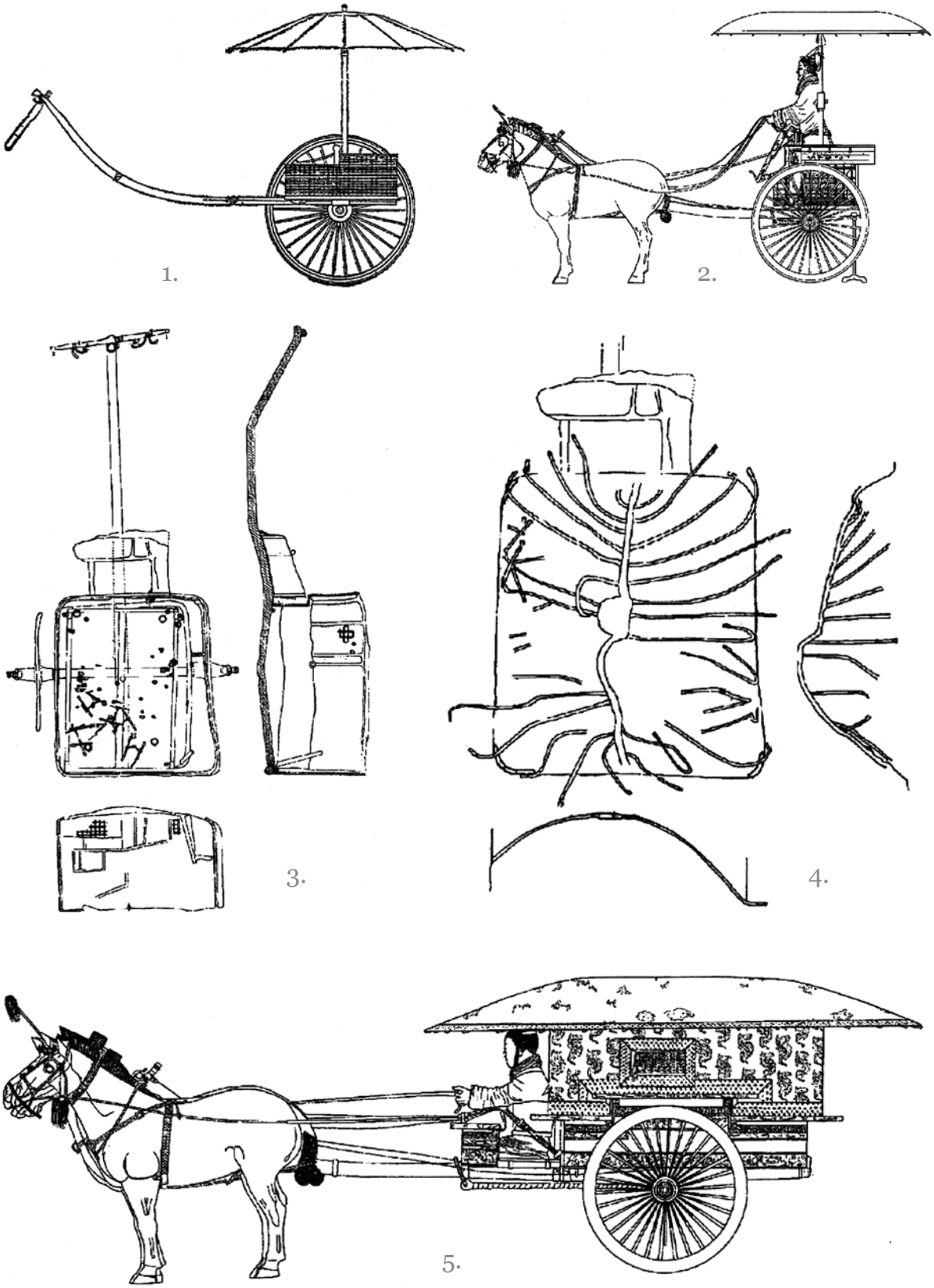


Fig. 139. Official vehicle. 1 – Pinlyanmyaochzhuan, chariot 1; 2 – Mausoleum of Qin Shihuang, chariot 1; 3, 4 – Maanchzhun, chemakyn 2, chariot 13; 5 – Mausoleum of Qin Shihuang, the chariot 2. [Wu, Hsiao-yun, 2009, p. 40].

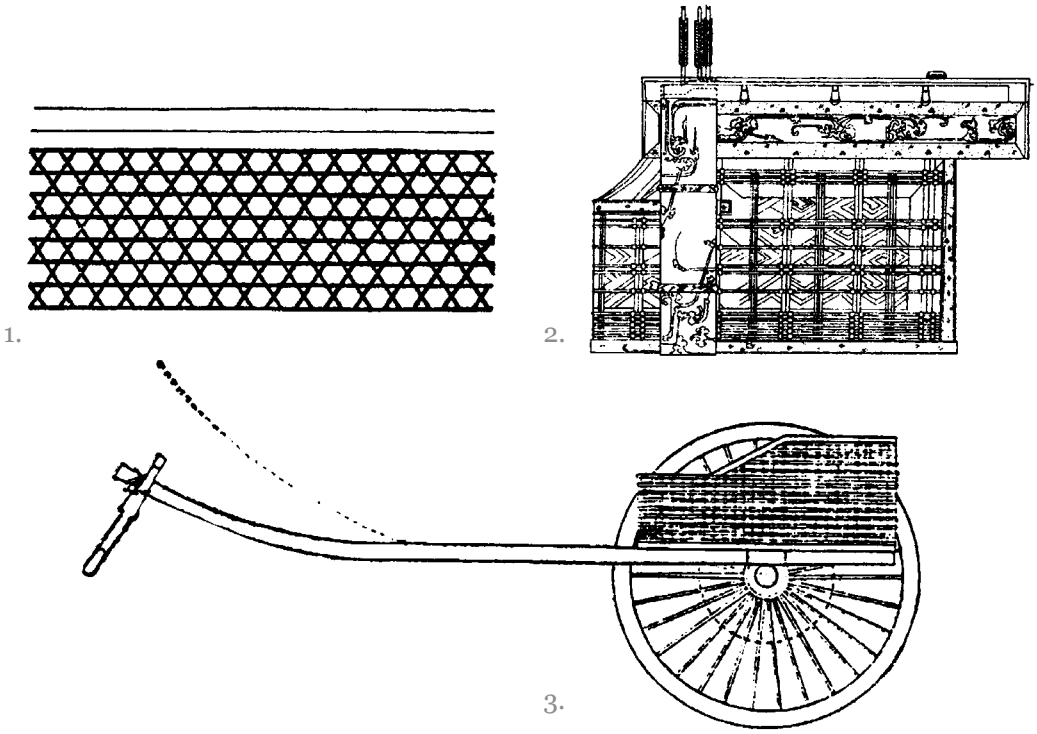


Fig. 140. Decorated sides of chariots: 1 – Fensyabatsitun, BS 33 (Western Zhou); 2 – side view of a chariot 1 Qin Shihuang; 3 – Pinlyanmyaochzhuan, chariot 2 (late Zhango). [Wu, Hsiao-yun, 2009, p. 42].

a special partition. On top it was covered by felt, skins or tissues in order to protect valuable cargo from bad weather. It is represented in the burial ground Tyanmatsuchun, Zone J 4, no. 2 (Fig. 137:2);

3.3. A covered cart (van) with blindsides and a canopy roof, discovered in the necropolis Maanchzhun, chemakyn 2, no. 13, of the Late Zhanguo period. It is a prototype of a bronze vehicle no.2 of the Emperor Qin Shi Huang, equipped with a special open place for a charioteer, in the front of the vehicle, directly on the draught-pole and separated from the main van (Fig. 139).

4. Representative vehicles. The most elegant, decorated and well equipped crews, real masterpieces, «Rolls-Royces» of the chariot industry of the ancient China. These include the following types:

4.1. – Chariots with an umbrella from the necropolis Pinlyanmyaochzhuan, no. 1, and the mausoleum of Qin Shi Huang no.1;

4.2. – Covered carts (vans) with windows and the rear door from the mausoleum of Qin Shi Huang, no.2;

4.3. – Small chariots on human draught found in the burial ground Fensyabatsitun, BS26 of the Early Chunsyu period, and on the ceiling of the tomb in Bantszyachzhuan, the Lunsyan county, of the Qing epoch. These chariots, like palanquins, are intended for use of humans as the pulling force and were applied for ceremonial journeys of the emperor or nobles.

In a chemakyn, located 20 m southwest of the tomb of Qin Shi Huang, a unified funerary complex with vehicles was discovered; found and restored were two exact bronze copies ½ of the original size: chariots with an umbrella (no. 1) and a van (no. 2) drawn by four horses. According to Chinese archaeologists, this chemakyn contains another 8 vehicles, not yet excavated.

Fig. 141. Qin Shihuang funerary complex. General view during the excavation (chariot number 2) and restoration (chariot number 1) [Qin Wen, 2009, p. 114, 117].

The first chariot with dimensions of 2.25 x 1 m, was mounted by a wonderful sculpture of a charioteer the reins in hands, dressed in a long robe with a waistband and an attached sword. He drives standing; behind him is a massive stand with an umbrella. The chariot is equipped with a crossbow in a specially designated place on the body's front board; a separate rectangular container for arrows of various types and a defense shield are on the board's right side. The whole chariot is assembled from more than 3500 different parts (Fig. 141).

The second chariot by size 3.17 x 1.06 m is a bronze copy of a van on two wheels with 30 spokes, with walls made of wooden boards, covered with a roof-top of a 4 mm thick elegant canopy. Driver, with reins in his hands, is sitting in his knees in the front of the vehicle. There are windows on both sides of the van and the in the front wall, with shutters, decorated with carved diamond-shaped ornament. A door in the rear wall has a silver bar with a curved handle on the left side. The vehicle weighs 1241 kg and consists of 3462 parts, including 737 golden and 983 silver details, and is even equipped with a field kettle (Fig. 142).

Use of representative chariots in rituals and ceremonies of Heaven worship and sacrifices is described in ancient Chinese written sources. The «Shi-Tzi» («The Historical Notes») provide details of the Emperor Qin Shi Huang journeys surveying the subject territories, during one of which in 210 BC he, in fact, died.

According to special court regulations, a train of 81 chariots should be formed for the most important trips, and a train of the 36 chariots for less important ones [Sima Qian, 1972].

A pictorial tradition occupied an important place in the ancient chariot manufacturing industry. Artifacts from the Chinese chemakyns convincingly evidence this tradition persistent during many centuries. It is reflected in use of precious cowrie shells (an equivalent of money) in the headbands of horse harness, in use of «pao» bronze and golden plaques, zoomorphic and anthropomorphic plaques in bridles and in decorations of the bodies of archaic chariots. Special grace is manifested in decoration of

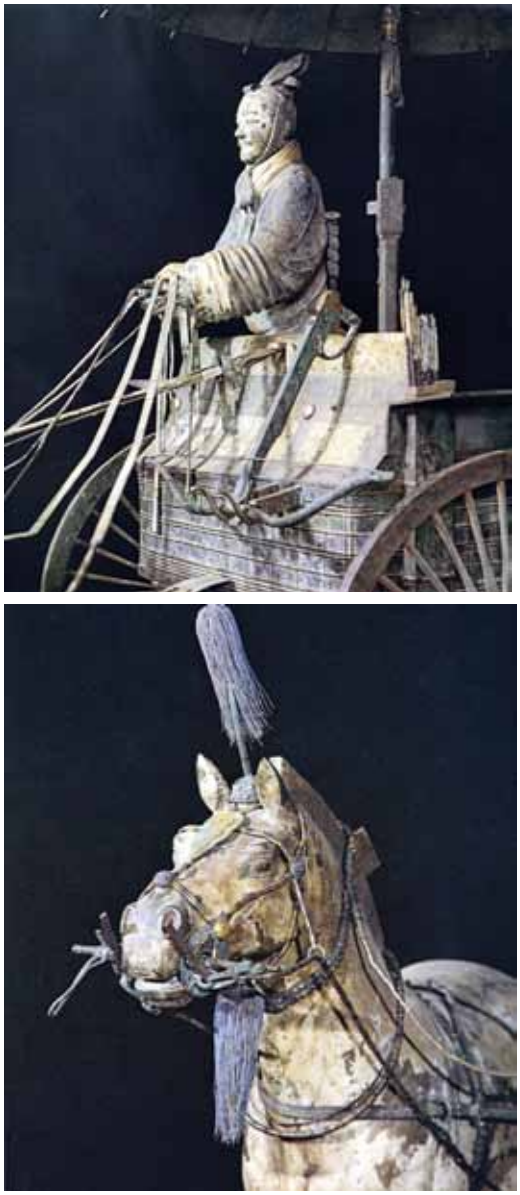


Fig. 141A. Qin Shihuang burial complex. Bronze Chariot number 1. Details. [Qin Wen, 2009, p. 123].

Fig. 141B. Qin Shihuang funerary complex. Bronze Chariot number 1. Details: Quiver (box) with arrows attached to the left sidewall of the chariot; piece of harness and a bronze shield. [Qin Wen, 2009, p. 126].

cross-bar yokes, saddles yokes and draught-poles by various bells, yoke tops and tips. In the Western Zhou period, all significant construction parts of the yoke and the vehicle, such as draught-poles, axles, checks and sidewalls were decorated. There are finds of colored chariots decorated with mineral paints, from a burial ground Tyanmatsuchun, a tomb Beychzhao. In Fansyabatsitun, BS33, sidewalls of the Early Zhou chariot were decorated with geometric ornaments.

Both unearthed vehicles of the Emperor Qin Shi Huang were artfully painted outside and inside in red, green, brown, blue and other colors and decorated with geometric patterns, as well as with clouds, phoenixes and dragons at the highest artistic level. Of a particular interest is the decoration of the chariot no.1 sides: it is a geometric meander pattern, a classic example of the steppe «sign code» of the Andronovo pottery (Fig. 140).

Fig. 142. Qin Shihuang funerary complex. Bronze Chariot number 2. General view and details: camping kettle and a harness. [Qin Wen, 2009, p. 121, 127].

Next step in evolution of Asian chariots was expressed in the invention of «sickles» attached to axles of war chariots, like with the late Achaemenid ones [Nefedkin, 1997, p. 10], and in discovery during the Han Dynasty way of a new shaft harness, enabling to harness one animal [Littauer, Crouwel, 1979, p. 10-25], which was actively utilized until recently. ■

Chariot's harness and equipment

An important element of chariot harness is the headband of draught horses, a feature of which is shield cheek-pieces with spikes and angles on edges, found in situ on horse heads together with remnants of a chariot in the burial ground Sintashta [Gening, 1977, p. 66-69] and in the Shang-Yin graves [Varionov, 1980, p. 168]. There were repeated attempts to classify the psalii [Smirnov and Kuzmina, 1977, p. 44-45, Fig. 11 Kuzmin, 1980, p. 8-21, 1994; Pryakhin, 1976, p. 122-124].

G.B. Zdanowicz, exploring the collection of steppe shield psaliis, came to the conclusion that «the round and rectangular psaliis with spikes coexist for a long time. These are species of one category of psaliis, the shield psaliis. The shield form was largely determined by its material. The round or rectangular psaliis developed similarly: with appearance of an additional butt hole on the shield, and with their ultimate complete disappearance» [Zdanowicz, 1985, p. 110-120, 1988, p. 138-139].

The wide geographical spread of different types of psaliis gave ground for many researchers to generate hypotheses about the origin and distribution of these objects in the area of the continent. E.E. Kuzmina assumes the appearance of a psalii in the steppe zone of Eurasia, from where they spread to China, Greece and other regions [Kuzmina, 2000]; an opposite view is expressed by other researchers [Oancea, 1976; Boroffko, 1998].

All known systems of horse bridles, of which horn psaliis are an integral part, based solely on the use of organic bits, i.e., an ordinary thick rope or braided together rawhide strips (Fig. 145). These headbands stem from a simple knot which was tied on the upper or the lower horse jaw [Sorokin, 1990, fig. 15], or from a cavesson-halter, which was a system of knots and ropes or leather straps arranged in a basket that fits horse's muzzle [Smirnov, 1961, p. 63] (Fig. 145-146).

An addition of a new device to the bridle – the shield psalii – was intended to increase pressure on the sensitive bones of a horse's head with help of spikes or edge angles. It is required for remote control of a pair of animals and as an additional means to compensate for deficiencies in dressage of horses.

There is no reason to believe that the rod psaliis with 2-3 holes were used only in the headbands of riding horses, because such could become also a well-trained chariot horse. Some Egyptian and Assyrian reliefs clearly show the rod psaliis on the chariot horse bridles.

Guiding a horse (turns and stops) is made by pressing bits on a toothless edge of the horse lower jaw (Fig. 147). When pulling the right rein, the snaffle impacts the right side of the jaw, when pulling the left rein it impacts the left side of jaw. The easiest way to control two-horse vehicle, is to hold two reins in each hand: two left reins with in his left hand and two right reins with the right hand, so that each horse is controlled by one-horse reins. A variation of this method is the «right» reins in one hand, the «left» in another. Pulling this or other pair of reins leads to a turn in the appropriate direction. At the same time, snaffles of both horses are interconnected.

A more sophisticated method is shown in the model of a bronze quadriga of the Chinese emperor Qin Shi Huang, and differs from the described above by the fact

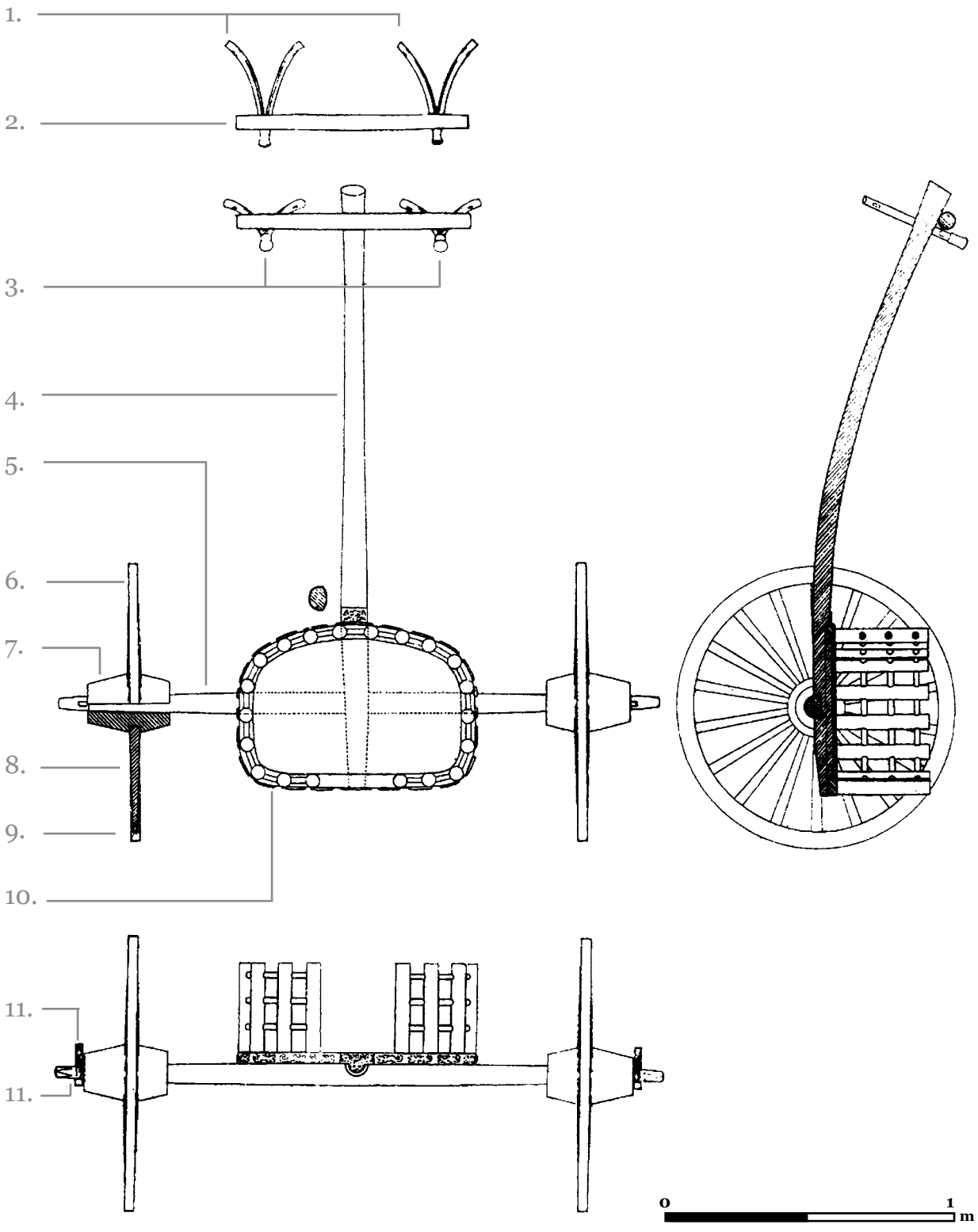


Fig. 143. The cemetery Xiaotun M40. Reconstruction of the chariot (late Shang): 1 – yoke-saddle; 2 – yoke-beam; 3 – tops on the yoke-saddles; 4 – central drought-pole; 5 – axis; 6 – wheel; 7 – wheel hub; 8 – spoke; 9 – rim; 10 – platform for the charioteer (the body); 11 – check to fix the wheel on the axis; 12 – tip of the axle. [Wagner, 2004, abb. 3].

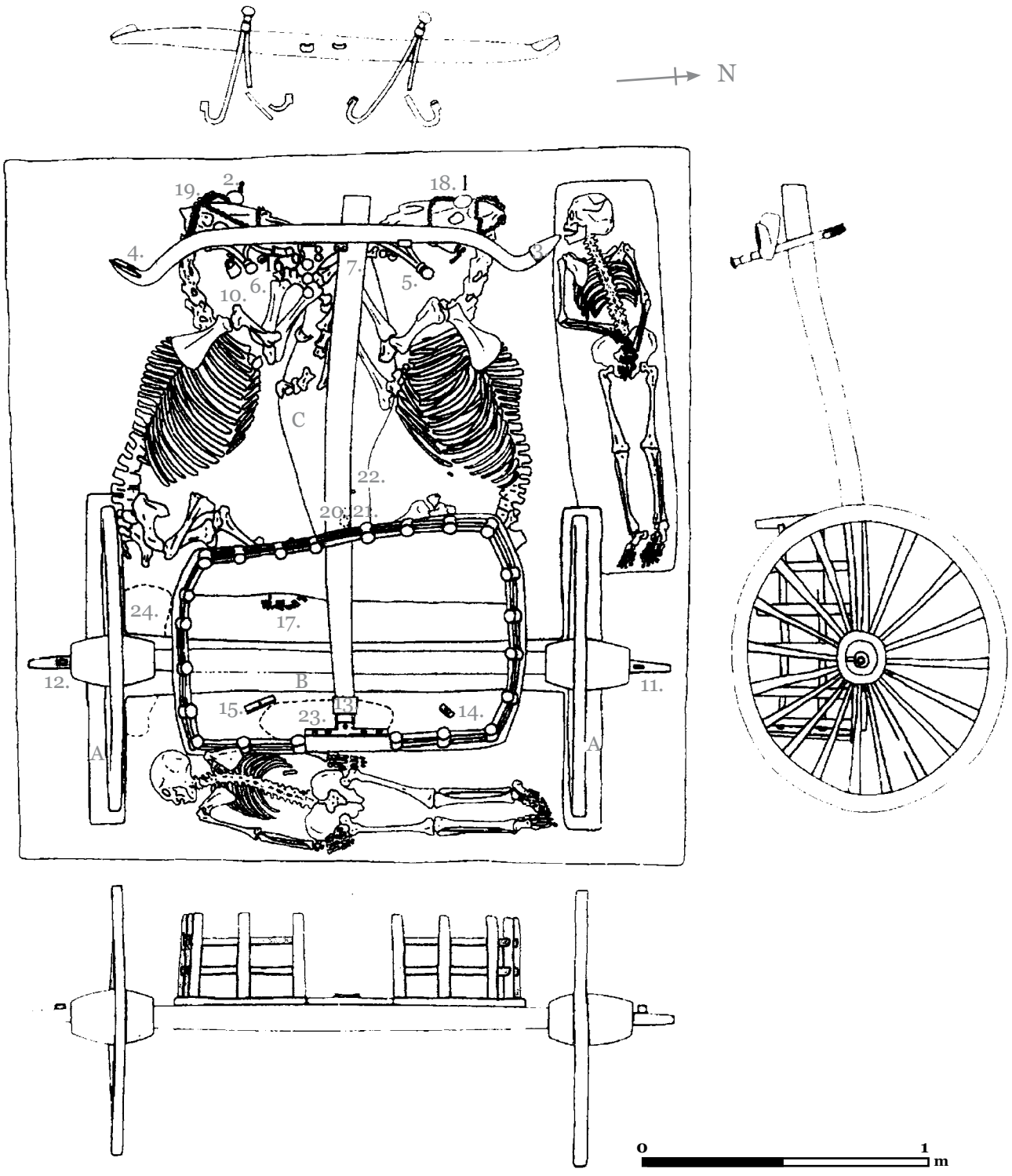


Fig. 144. The cemetery Gotszyachzhuan, M 52. Found: 1, 2, 9, 20 – 22 – bronze plaques; 3, 4 – tops on the ends of the yoke; 5, 6 – yoke-saddle; 7, 8 – bit (psalii) in the form of masks; 10 – the tongue of bell; 11, 12 – tips on the ends of the axis; 13 – bearing / bushing for mount the drought-pole; 14, 15 – tops (heads?); 16 – ring from the shell (element headband); 17 – clip-mount for leg (?); 18, 19 – cowry shells (headband straps); 23, 24 – remaines of varnish and wood. [Wagner, 2004, abb. 5A].

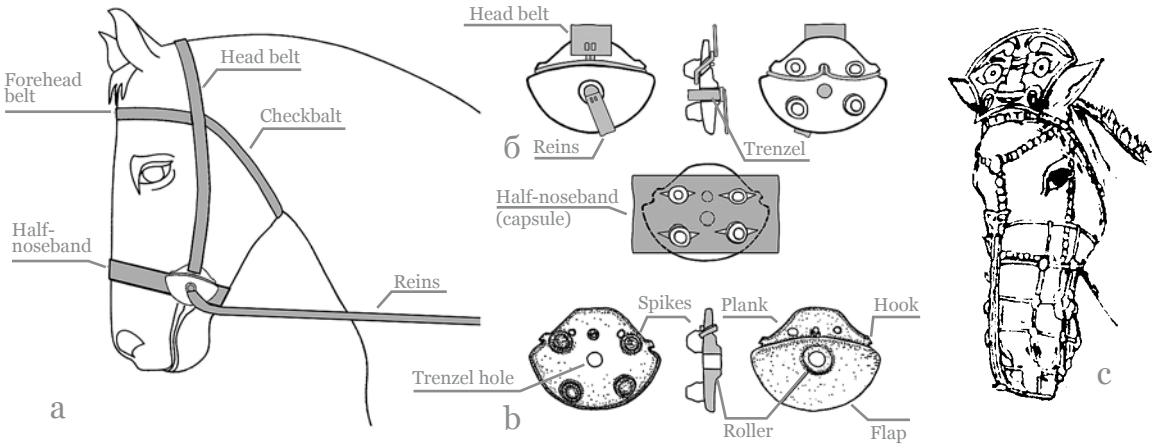


Fig. 145. Reconstruction of the headband (a, b). [Epimakhov, Chechushkov, 2006, fig. 6]. Reconstruction (c) based on chemakyn from the Museum in the village Zhantszyaopo (reconstructed ligaments of cowrie shells on the headband straps).

that used are horse-pair reins, and there are two shaft horses under the saddle-yokes and two outrunners. This reining method facilitates the control, as the driver keeps in his hands a pair of reins: reins of two shaft horses are fixed and attached to the body of a chariot, and remaining left reins (from four horses) are united in one left rein, and the remaining right reins into one right rein. Pulling of one of the reins leads to a simultaneous effect on all four horses at once. Special plumes mark the head of a main horse the bridle of which has a disc, a rudiment of the psalii, control of which determines the motion of other horses in the harness.

For comparison: in the modern method of four horses harness, horses are linked to each other, but there are two options: 1) inner rings of the snaffle are joined, 2) the ring are linked in pairs: the left with the left, the right with the right.

In any case, the reconstruction of the chariot horse headband holds as a key element the shield psalii with its slat, to which a head-strap is fixed. Types of psaliis and disposition of additional holes and hooks for the head-strap influenced the functional impact on draught animals [Epimakhov, Chechushkov, 2008, p. 205-211].

Analysis of the steppe funerary complexes for presence of chariots and the psaliis showed that they two do not obligatory accompany one another in a funeral rite. Psaliis were found in 9 out of 20 recorded cases, while their sources are growing in number every year, so that today more than 150 exemplars were found in 57 complexes of the steppe and forest-steppe zones of Eurasia [Epimakhov, Chechushkov, 2010, p. 183-191].

Having mathematically analyzed the database, describing 107 psaliis from 57 archaeological monuments located in the Urals (28), Trans-Urals (53) and Kazakhstan (24), authors identified three types of chariot psaliis – Sintashta, Petrovka and Alakul' – representing stages in the evolution of the chariot harnesses, and which were tested by the authors in the experimental use of replicas on real horses [Epimakhov, Chechushkov, 2004, p. 39-45].

The Sintashta psalii are of two versions: archaic and classic; made exclusively of horn, have typical high curved spines, nec-

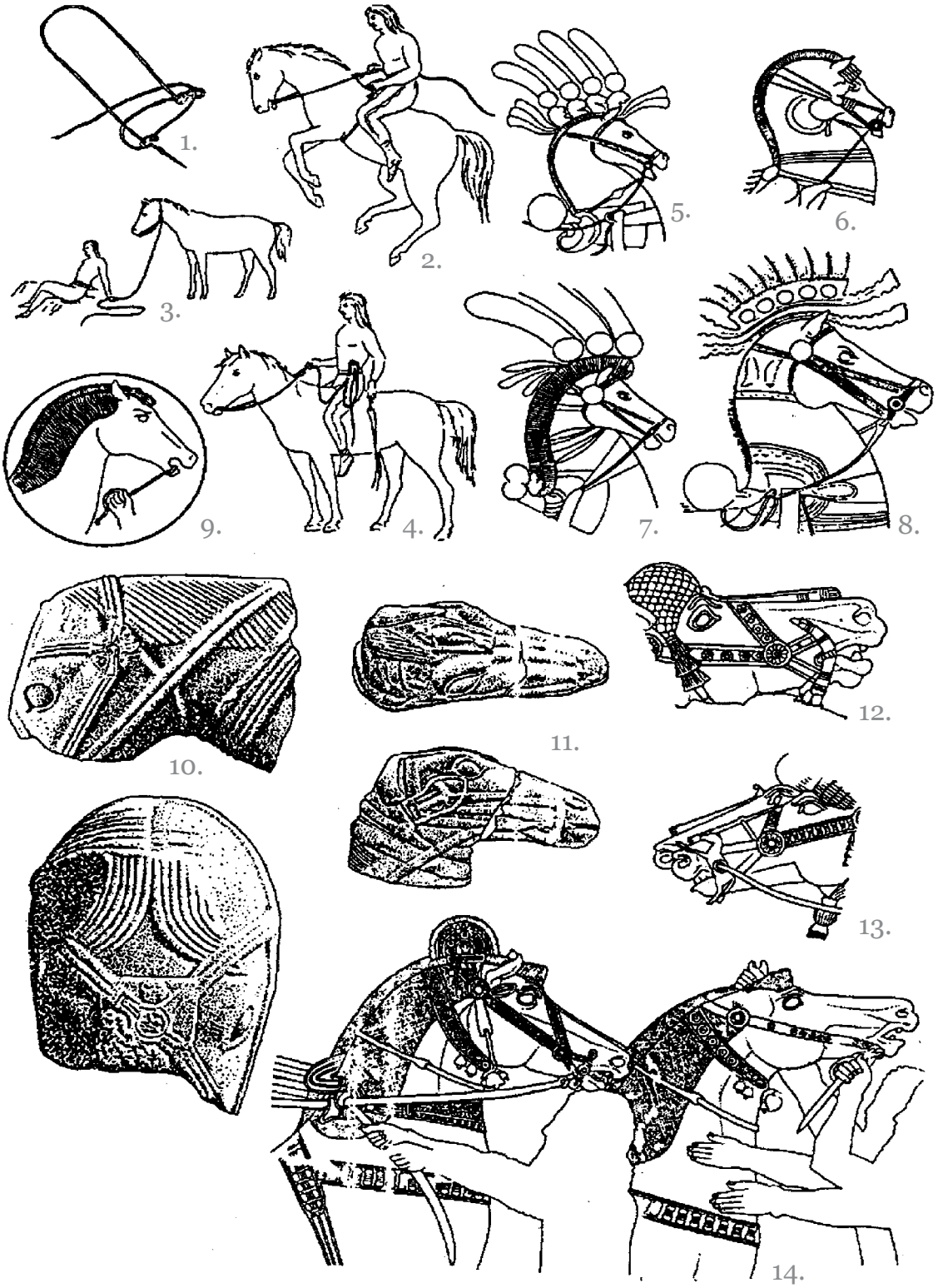


Fig. 146. Types of horse bridle: 1-4 – bridle of Blackfoot Indians; 5 – tomb of Ramses II (1317-1251 BC); 6 – tomb of Ramses IV (1204-1180 BC); 7 – grave Amenhotep II (1491-1465 BC); 8 – tomb of Tutankhamun 8 (1400-1392 (?)BC); 9 – ditail of Assyrian stone relief; 10-11-stone heads of the horses from Zinzhirli, Berlin, Museum of Pergamon, NN 3008, 3004; 12-piece of stone relief of Ashurbanipal, Nineveh, London, British Museum, N 124,875; 13-piece of stone relief of Sennacherib, Nineveh, British Museum, N 124 873; 14-piece of stone relief Ashurbanipal, Nineveh, London, British Museum, N 124 859. [Sorokin, 1990, p. 97-147; Littauer, Crouwel, 1979].

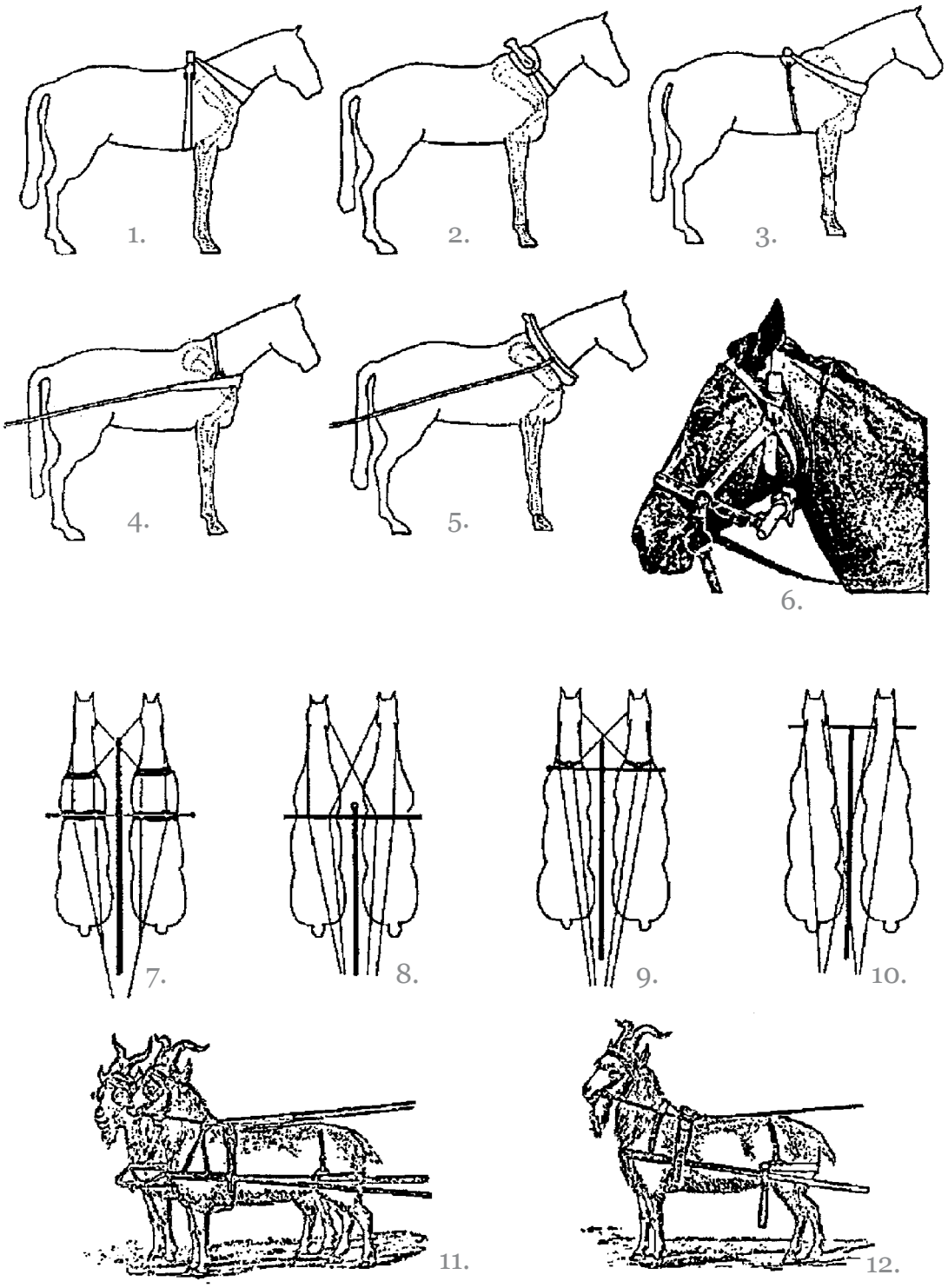


Fig. 147. Types of ancient systems of harnessing: 1 – harness system with two belts – tractive force is created the bottom of the neck, which was inconvenient for the animal; 2 – harness system with yoke-saddles and fixing belts – tractive effort to create an animal shoulders; 3 – dorsal system, clip (belt) surrounds the chest – tractive effort to create an animal-feeding; 4, 5 – the modern system of harnessing the horses; 6 – mount the yoke to the headband (the Saharawi frescoes); 7 – modern steam team; 8 – an ancient steam team and dorsal yoke system; 9 – team with an ancient yoke-saddles; 10 – doubles team with an ancient cross-bar of the yoke attached to the headband; [Spruytte, 1983]; 11, 12 – teams with goat [catalog of patents in 1890. Patents issued in the 1706-1707 years].

essary for rigid control of horses through fastening to the capsule belt; have a trapezoidal slat with a standard set of holes for attaching to the head-belt and with a roller around the snaffle hole. The authors admit, after E.E. Kuzmina [1994], the origin of the archaic variant in the southern Russian steppes (Babino).

The Petrovka psaliis is a next evolutionary step from Sintashta: instances of new bone material appear, the slat and ways of its attachment to the headband were modified.

The Alakul' psaliis is another stage in the evolution after two previous types: the slat shape gets elongated, a hole for attaching the headband straps appears on a different plane; spikes get much smaller or disappear altogether, possibly due to change of the snaffle and use of bone and wood in making a bit. The psalii actually loose their former function and are, rather, a decorative element and a distributor of the headband straps. This type of psaliis clearly demonstrates the relationship with the Don-Volga tradition of making psaliis (the Abashevo-Timber-Grave cultural-historical area) with no clear chronological priority so far (Fig. 148).

Further evolution of chariot harness, obviously, was expressed in modifications of the bit, mouth-pieces and the whole headband system. Psalii gradually lost their function and become decorative distributors of headband straps. For example, the psaliis of the burial ground Amangeldy [Zdanowicz, 1988, p. 69, fig. 28.10, 12] is a crosscut tubular bone with holes and edge angles on one side, adjacent to the horse's head. In one set with this psalii, a small bone tube was found, which coincided in the cross-section with the inner diameter of the psalii. Perhaps, these items were used in a set. Psalii from the shaft tombs IV at Mycenae are fixed together with bone tubes, inserted in the center hole, which caused doubts in attributing them to psaliis [Littauer, Crouwel, 1973, p. 207-213].

It is possible to imagine the use of bone tubes as a sort of «enhancers» of organic bits. If it is so, then design of psaliis from the Amangeldy burial ground requires a different headband. Evidence in favor of this type of ring psaliis without bony tubules comes from similar findings of the Andronovo settlement of Kreschenovka in Central Kazakhstan (excavations by Chindina A.Yu.), an Abashevo mound near the Ilovatka village [Liberov, 1980, p. 21-24, Fig. 1-4].

Availability of the headstraps in the chariot harness were fixed in the Shang-Yin chemakyns (Dasykuntsun) on horse skulls by bundles of Pao plates, adorning the headband straps [Kucera, 1977, p. 135, fig. 65]. On a knife top in the form of a horse's head from the Yin settlement, a headband with a single headstrap was shown [Kozhin, 1990, 47]. In China, in Shang-Yin times, in use were shield psaliis with edge-angles or spikes in the form of tubulus, which were always in combination with organic bits [Varionov, 1980, p. 168].

This is an obvious result of borrowing of the form and the function of the steppe rectangular psalii with spikes. Bridles of Western Zhou chariots (the Bayfu burial ground) are supplied with the horn rod psaliis with special bronze spiked covers [Jam, 1984, fig. 17, p. 48-49], which well correlates with the bridle development in the steppe zone.

Thus, the capsule (the nose and chin straps) originally in use, with invention of the headstrap, which permitted to fix bits and all other straps around the horse head more rigidly evolved into the headband.

Further, the headstrap ends, attached to the psaliis, got divided; new headband straps, a throat-lash and a browband, emerged and developed, and this led to the preferential use of the rod psalii.

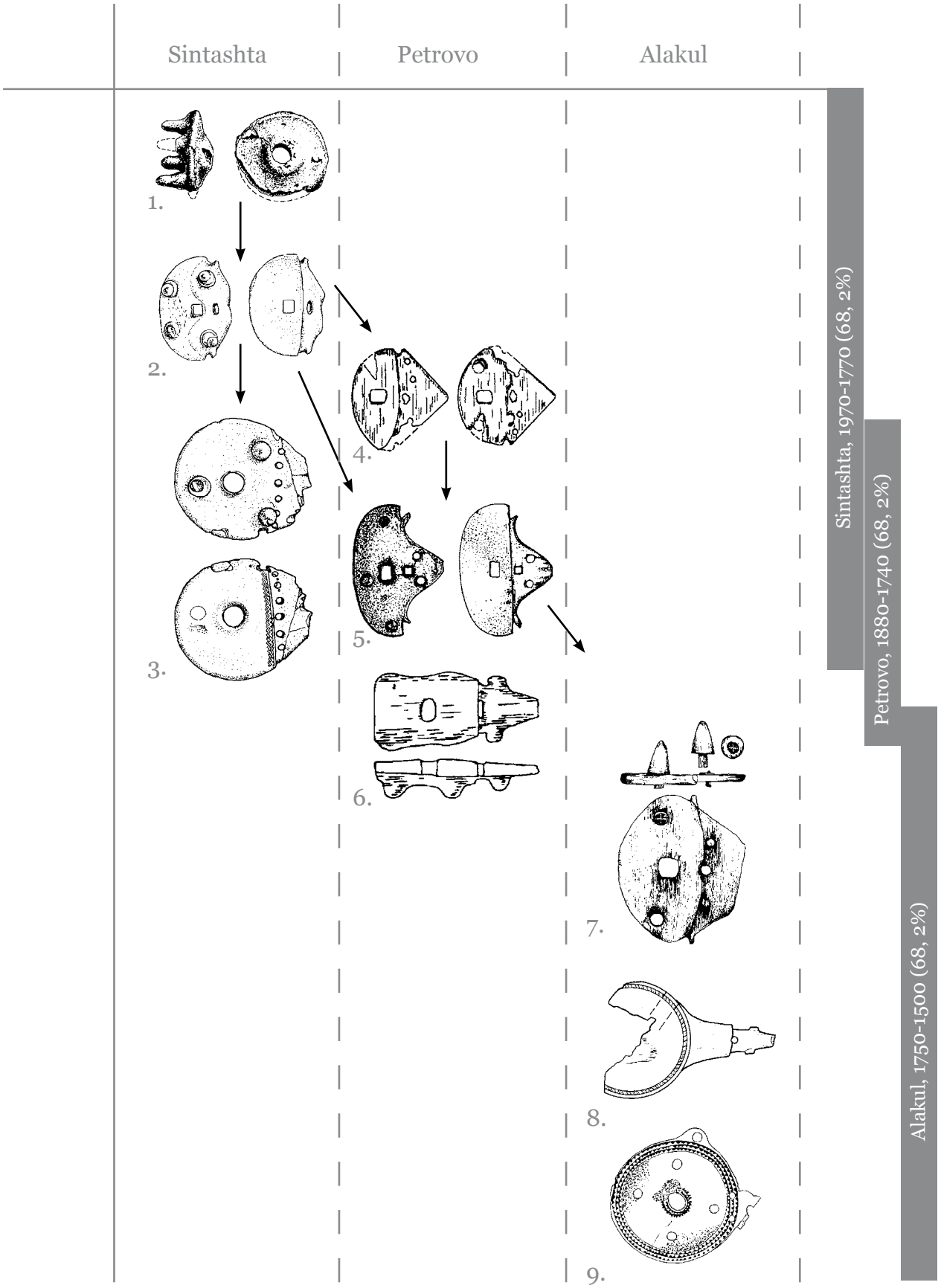


Fig. 148. The evolution of forms of Psaliis. 1-3 – Sintashta culture; 4-6 – Petrovo culture; 7-9 – Alakul culture. [Chechushkov, Epimakhov, 2010, p. 213, fig. 8].

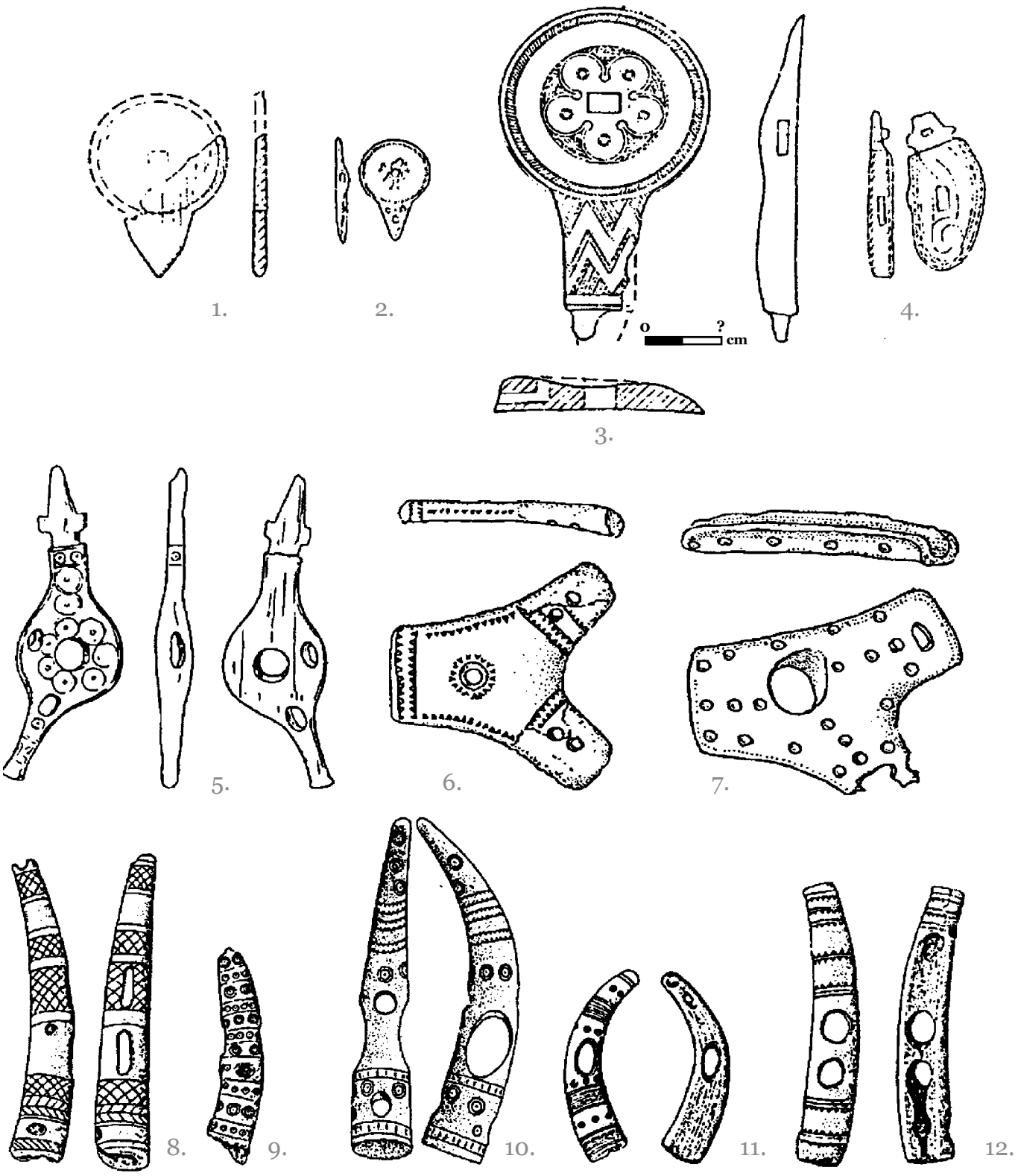


Fig. 149. The transitional type of harness: 1 – Petrovka II; 2 – Vatina; 3 – Novonikolskoe cemetery, barrow 5, grave 2; 5-Toseg-C; 6 – Neyrgesuyfalu – Teglagyar; 7 – Pakozdvar; 8-9 – Toseg; 10 – Beydzhesultan, Anatolia; 11 – Pakozdvar; 12 – Karastarcha. [Piggott, 1983, fig. 56-57; Littauer, Crouwel, 1979; Zdanowicz, 1988, fig. 4].

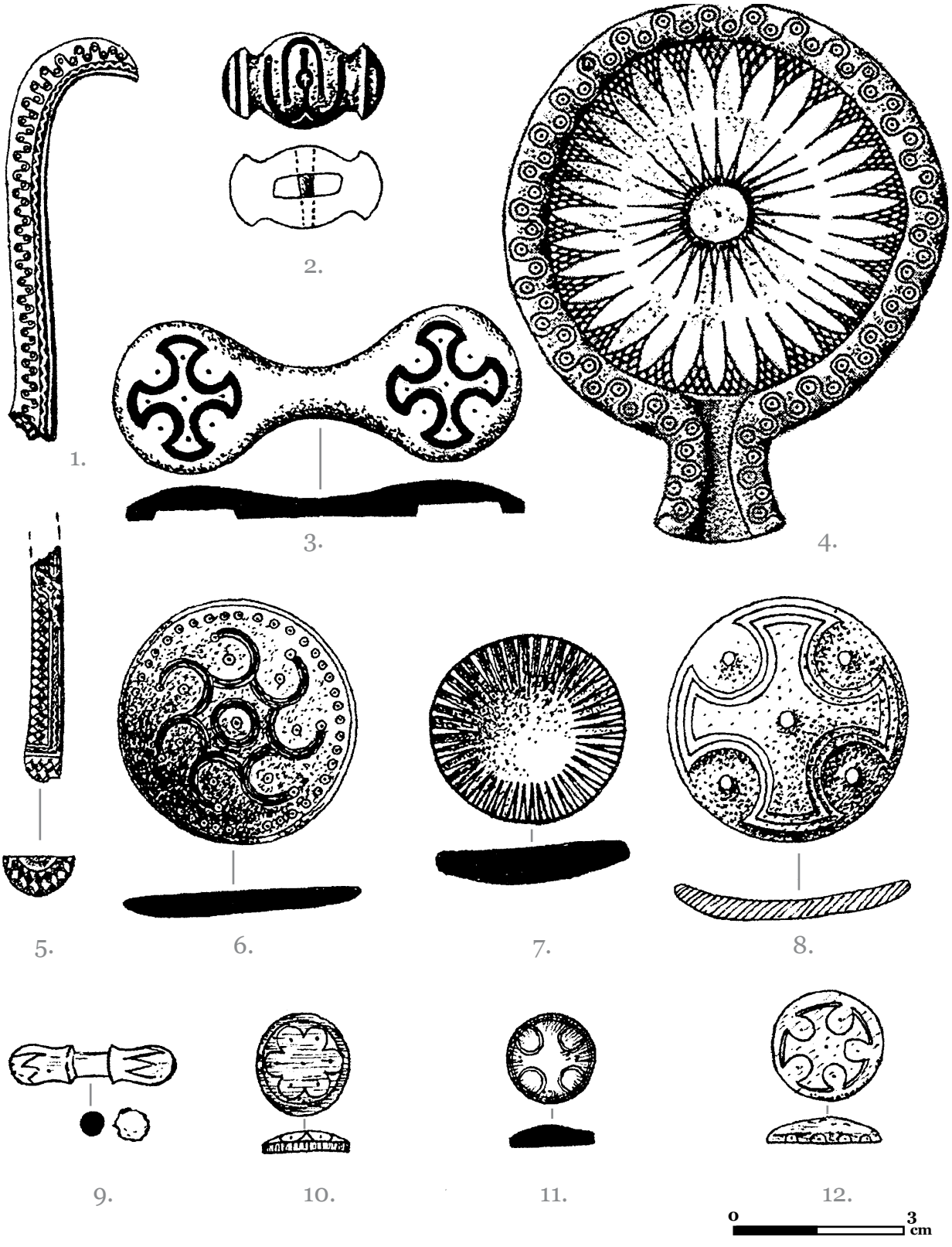


Fig. 150. Central Kazakhstan. Products made of bone and horn. 1, 5 – «wands»; 2, 9 – «zip»; 3 – double plaque; 4 – «mirror», 6, 7, 8, 10-12 – rounded plaque. 1-4, 6, 7 – settlement Kent; 5, 8, 10, 11 – settlement Myrzhik; 9 – Dandybai; 12 – Aktoprak [Kukushkin, 2007, p. 145, fig. 1].

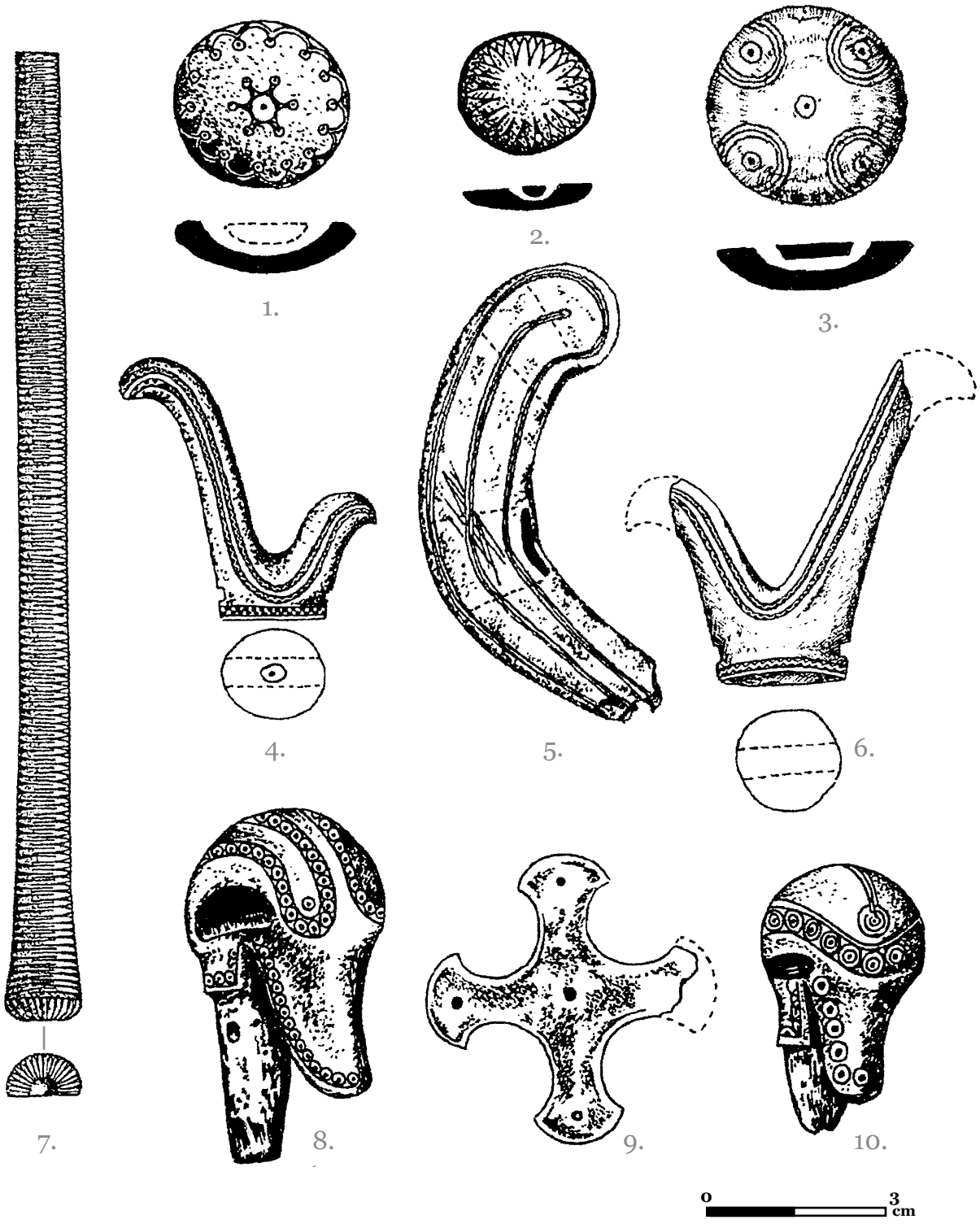


Fig. 150A. Central Kazakhstan. Products made of bone, horn and bronze. 1-3 – «buttons»; 4, 6 – «ducks»; 5 – psalii; 7 – «rod»; 8, 10 – tops; 9 – bronze plate. 1, 2, 4, 5, 7, 8, 10 – settlement Kent; 3 – settlement Myrzhik; 6 – settlement Shortandy Bulak; 9 – burial Sangru III [Kukushkin, 2007, p. 146, fig. 2].

This transition type (Fig. 149:5-7) includes the triangular shape exemplars from the Hungarian monuments of the middle of 2nd millennium BC: Pakozdvar, Fyuzeshabon, Neyrgesuyfalu-Teglaygyar [Piggott, 1983, p. 101, fig 57] and rod-shield psaliis from Toseg, Fyuzeshabon which have the shield as a base of their design [Mozsolics, 1953, fig. 6, 4-6]. These items can be used only in a headband where a headstrap has two ends.

As a result of the evolution, a headband type, with double or triple headstrap ends and with three-holed rod psaliis of various shapes, appears classic to the steppe (sometimes with a hole for bits; then a cheek double strap was attached to the psalii ends). Psaliis of this type were found in the settlements Sabatinovka, Suskanskoe, Subbotovskaya (Late Timber-Grave) [Terenozhkin, 1965, p. 63-85] in the North Black Sea and the Volga region, in settlements Atasu and Kent in Central Kazakhstan (Fig. 150), in Hungarian monuments Toseg, Karastarcha, Pakozdvar [Piggott, 1983, p. 101, fig. 56].

The transition type represented by the rod-shield cheek-pieces in the Hungarian monuments was dated to the middle of the 14-13 cc. BC [Mozolics, 1960, p.125]. St. Piggott determines the psaliis with the middle of 2nd millennium BC [1983, p. 101]. He notes the similarity between the ornamental decoration of the Greek and Hungarian copies. Majority of researchers recognize the similarity between the Hittite (Aladja Hüyük) and the Hungarian (type Fyuzeshabon) rod psaliis, both in design and decor elements [Mozolics, 1960, p. 133-165; Foltiny, 1967, p. 23].

Dating of this form of the psalii is etsablished by the finds from the Aladja Hüyük in the Hittite layer of 1450-1300 BC. Similar exemplars occur in Beichesultan, Bogazkey, Alishar [Boemer, 1972, s. 201; Littauer, Crouwel, 1979, p. 88-95]. The upper chronological position of the rod psalii is set by finds from the Fyuzeshabon horizon, Toseg – C to the end of 12th cc. BC [Mozolics, 1960, p. 133-165].

The timeframe set for the chariots bridle with the rod cheek-pieces cannot be limited only to the specified period. According to the Assyrian palace reliefs and to finds from the Pazyryk barrows, the type was still used for a long time, being a main form of a riding horse bridle with Sakas and Assyrians.

At the same time, the revealed similarity of the rod psaliis of the Eurasian steppe, of Danube and of Anatolia indicate an interaction between ancient populations of the regions through the Caucasus. This assumption is consistent with the linguistic data.

Another important element of the chariot equipment is so-called «models of the yoke.» These are bronze objects with a flat or slightly curved base and two arcs (Fig. 151), the ends of which are made in the form of bells or rounded tops, with a total length of 28 to 40 cm. These items were found in the Karasuk graves of southern Siberia [Kiselev, 1951, Komarova, 1952, p. 33; Lipsky, 1956, p. 121, 124; Kozhin, 1969, p. 30-32, 1977, p. 35; Khlobystin, 1970, p. 188, 192; Chlenova, 1972, p. 121; Leontiev, 1980, p. 82], the Shang-yin and Western Zhou chemakyns [Varionov, 1984, p. 42-51; Komissarov, 1988, p. 55-56], in central and north parts of China, in the graves of the Tagar culture as bronze and bone models [Martynov, 1979, p. 131, 144], as images on deer stones and anthropomorphic sculptures of Mongolia [Novgorodova, 1989, p. 159-161, 198; Volkov, 2002]. By size, the South Siberian objects are smaller than Yin ones.

There are several hypotheses explaining the use of «the yoke models.» Chinese archaeologists believe that these are central pads to be put on the bow with a stretched or removed bowstring [Chen Tek'un, 1960, p. 207].

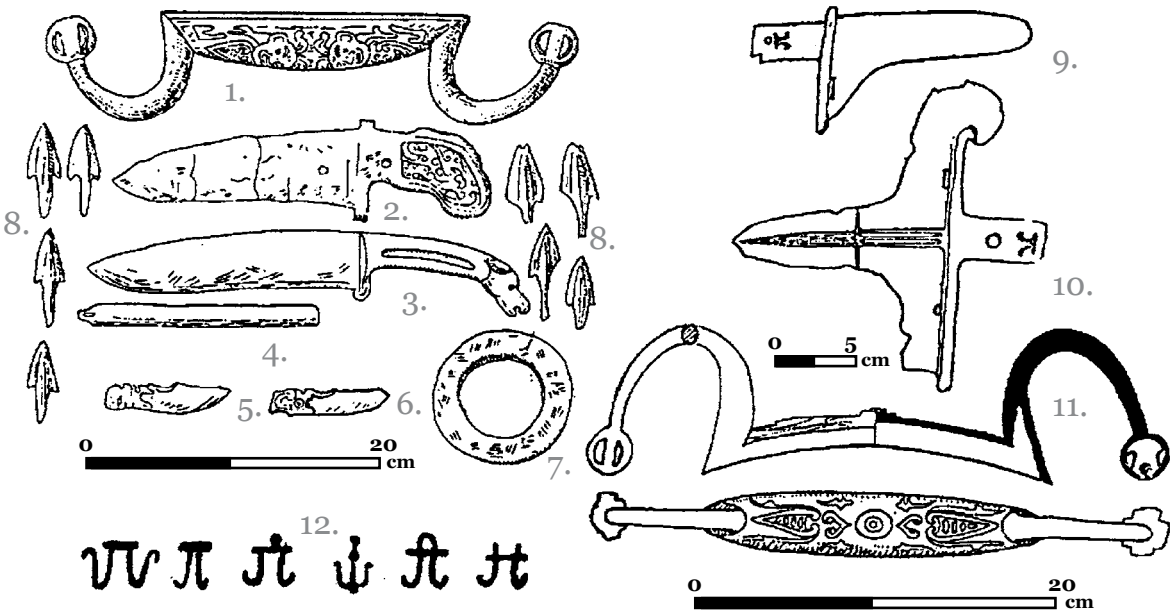


Fig. 151. China. «Models of the yoke». 1 – «model of the yoke»; 2 – klevets; 3 – knife; 4 – tube (?); 5-6 – end-caps of the bow; 7 – ring; 8 – arrowheads; 9-10 – «ge» and «tzhi» with pictures of «models of the yoke»; 11 – «a model of the yoke» from the grave in cemetery Baytsaopo M2; 12 – images of «models of the yoke» on the deer stones, Mongolia. [Varionov, 1980, fig. 1-3, 11, 14, 15].

Another view associates these items with a chariot harness using them as rollers [Kozhin, 1969, p. 30-32; Novgorodova, 1989, p. 159-161] or a special attachment to the belt of a skier when he follows a horse in winter time [Kozhin, 1977, p. 35, 1990].

A.V. Varenov suggested the use of «the yoke models» on waist as a kind of buckle rein-holder while driving a one-seat battle chariot [Varionov, 1984, p. 42-52]. This interpretation seens to be the most reasoned. Obviously, such items were part of the equipment complex of a warrior-charioteer [Varionov, 1984, p. 46]. The buckles were found in graves in the immediate vicinity to knives or daggers, which are known to be worn on a belt. Images of «the yoke models» on waist were recorded repeatedly on the front part of the deer stones in Mongolia [Novgorodova, 1898, p. 198]. Similar images are present on butt of two items «ge» and «dzy» found in the M2 tomb of the Bayfu burial ground of Western Zhou period (Fig. 151: 9-10).

It is remarkable that in the cult Catacomb burial with the wheels in the Crimean village Bolotnaya, there was a large ornamented bronze buckle together with the dog canine-amulet around the waist of the buried man [Korpusova, Lyashko, 1990, p. 169, Figure 1].

Images of hooks worn alongside with weapons on waist belts, are similar to the «balancing levers» on Mongolian deer stones, are noted on the Cimmerian and early Scythian sculptures [Terenozhkin, 1978; Korpusova, Belozor, 1980, p. 224; Popov, 1976]. Study of belts of nomadic peoples of Central Asia shows not only their great practical role, but also the traditional cult and ritual significance [Dobzhansky, 1991].

Thus, findings of «the yoke models» in Karasuk graves characterize the buried as relating to the class of charioteers.

The interpretation of A. Varenov is doubted by findings from the chemakyns of Dasykuntsun – M 175 and the sector «C» of

Anyang, M 20, where two of these «balancing levers» were fixed for each buried.

It seems that the contradiction can be dissolved if consider «the yoke models» as rein distributors, rigidly attached to the front handrail of the chariot body. This way, they significantly help steering a pair of harnessed horses and if necessary play a role of «the autopilot».

Perhaps, such function of the objects under consideration led to appearance in the design of the Zhou chariots of a special handrail-barrier [Komissarov, 1980, p. 160].

Moreover, the chariot of the Qing Shi Huang is equipped with special hooks in the front board for tying a pair of reins from two shaft horses. Such hooks are also required for attaching tracers, providing traction from the two outrunners in the quadriga.

The Shang-Yin burial ground of Gotszyachzhuan (Fig. 152-153) demonstrates a variety of chariot equipment items [Wagner, 2004, s. 107-122]. Thus, in the chemakyn no.52, many harness details were perfectly preserved: headband straps of a pair of horses, decorated with strings of cowrie shells, which served as an equivalent of money in early China, headband plates shaped as an anthropomorphic mask, bronze yoke-saddles, a bell, the yoke-bar points, a «shoe» and the support-box for attaching a draught-pole to the body, and the axle tips.

Later, in the Zhou time, a special bronze limiter appears from inside of the wheel. Together with bronze-tips of the axis ends, fixed by a special linchpin, these limiters fixed definitely the wheel from the opposite side of the axis and did not let it to «backlash».

Remains of varnish and wood dust in two spots on the bottom of the grave may indicate two shields belonging to two charioteers buried in this grave. There is also a special mounting for a charioteer's foot on the vehicle platform, which renders greater stability while driving the chariot and shooting (Fig. 144:17).

Let us consider the chemakyn number 143, 146, 147 and 148 [Wagner, 2004, s.112-115] from this burial ground: every tomb, as a rule, has one bronze psalii, the distributor of headband straps, and one arrow-like psalii. In grave 147, both psalliis are lying on the head of a horse, and near the axis is «the yoke model»; in grave 146, two psaliis are lying on two horse heads separately. This probably indicates varying degrees of training and restiveness of horses, as well as an individual selection of a headband type, and the possibility to use only one horse for steering a chariot, when reins of a second horse are tied to «the yoke model», a buckle, attached to a charioteer's waist or on the vehicle itself (Grave 147).

Interestingly, a man and a pair of a goat harness were buried in the neighboring tomb no.148. A bronze psalii was used to control goats: it is smaller, with pronounced edge-angles, similar in its effects on the animal jaw to horn shield spikes of steppe psaliis. Again, one psalii from one side of each animal's head was sufficient for their control. Obviously, it is was not necessary to have rigid psaliis of a snaffle type on both sides of the muzzle: one was enough to achieve the desired degree of control over a vehicle in the same way as it was enough to run one shaft horse in the pair harness (and also in trigas and quadrigas).

An important element of the chariots harness were saddle-yokes, locking the chariot yoke on necks of shaft animals. They were made of wood and even of bronze, were decorated with various bronze tops. The yoke together with yoke-saddles, obviously, was given a special magical significance: known are tombs of the Shang time, with burials of just one yoke (Fig. 154). Such burials of the

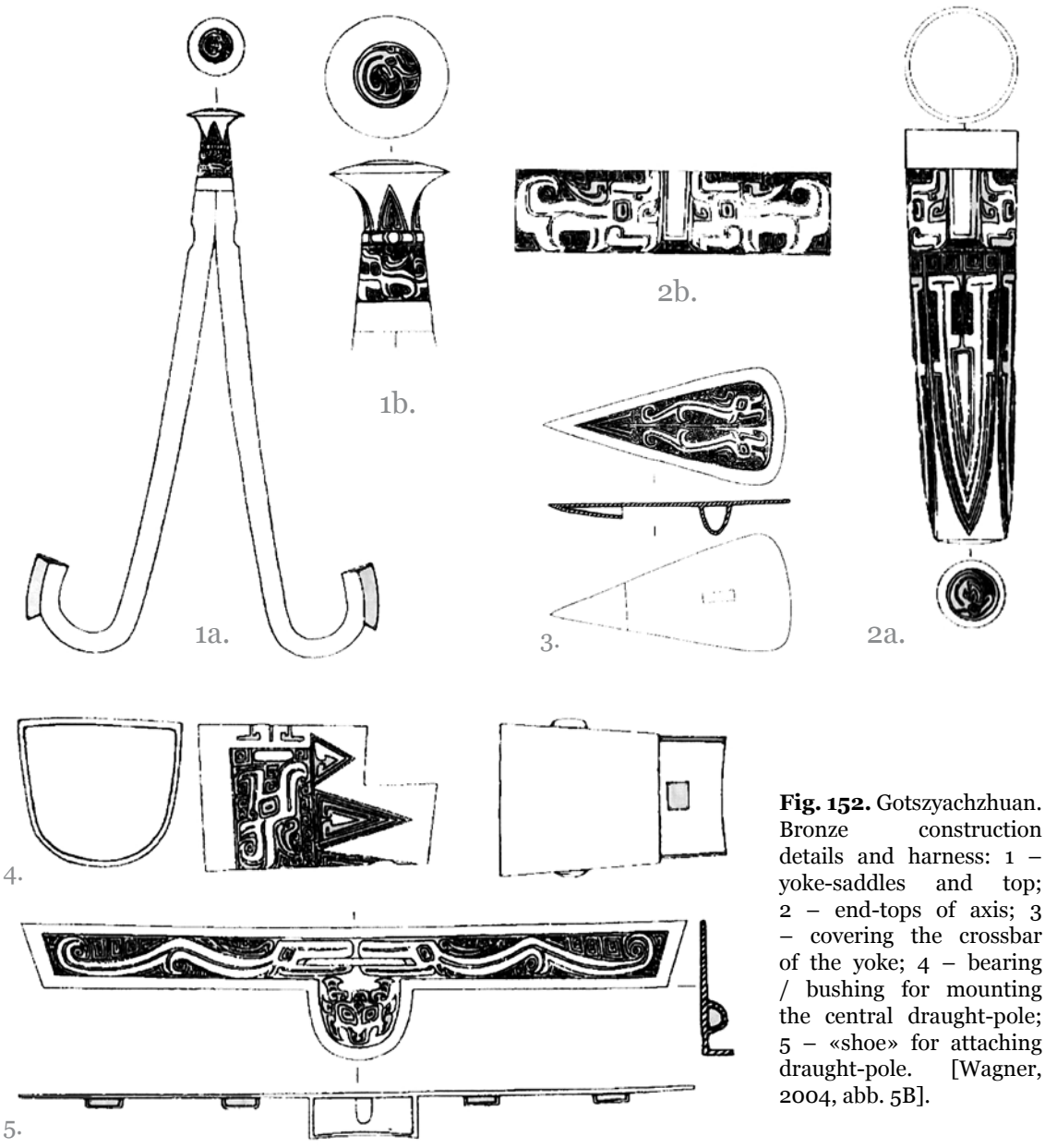


Fig. 152. Gotszyachzhuan. Bronze construction details and harness: 1 – yoke-saddles and top; 2 – end-tops of axis; 3 – covering the crossbar of the yoke; 4 – bearing / bushing for mounting the central draught-pole; 5 – «shoe» for attaching draught-pole. [Wagner, 2004, abb. 5B].

period of Late Zhou are known in the necropolis Beiyao, M118. Different bell types and draught-pole ornaments, found in chemakyns, witness the magical significance of the yoke (Fig. 155).

Chariot's harness in the Egyptian tradition

An entirely different tradition of making chariots bridles developed among the peoples of the ancient Near East (except the Hittites). All headband systems known here were developed on the base of the one-part metal bits (Fig. 156), equipped with a circular or rectangular bronze plates with spikes.

The next stage in the evolution of Middle Eastern metal bridles is the appearance of a two- part mouth-piece (bit). A variety of headbands were used depending on the psalii types. In the ancient Near East, the headstrap (cheek-strap) appeared in

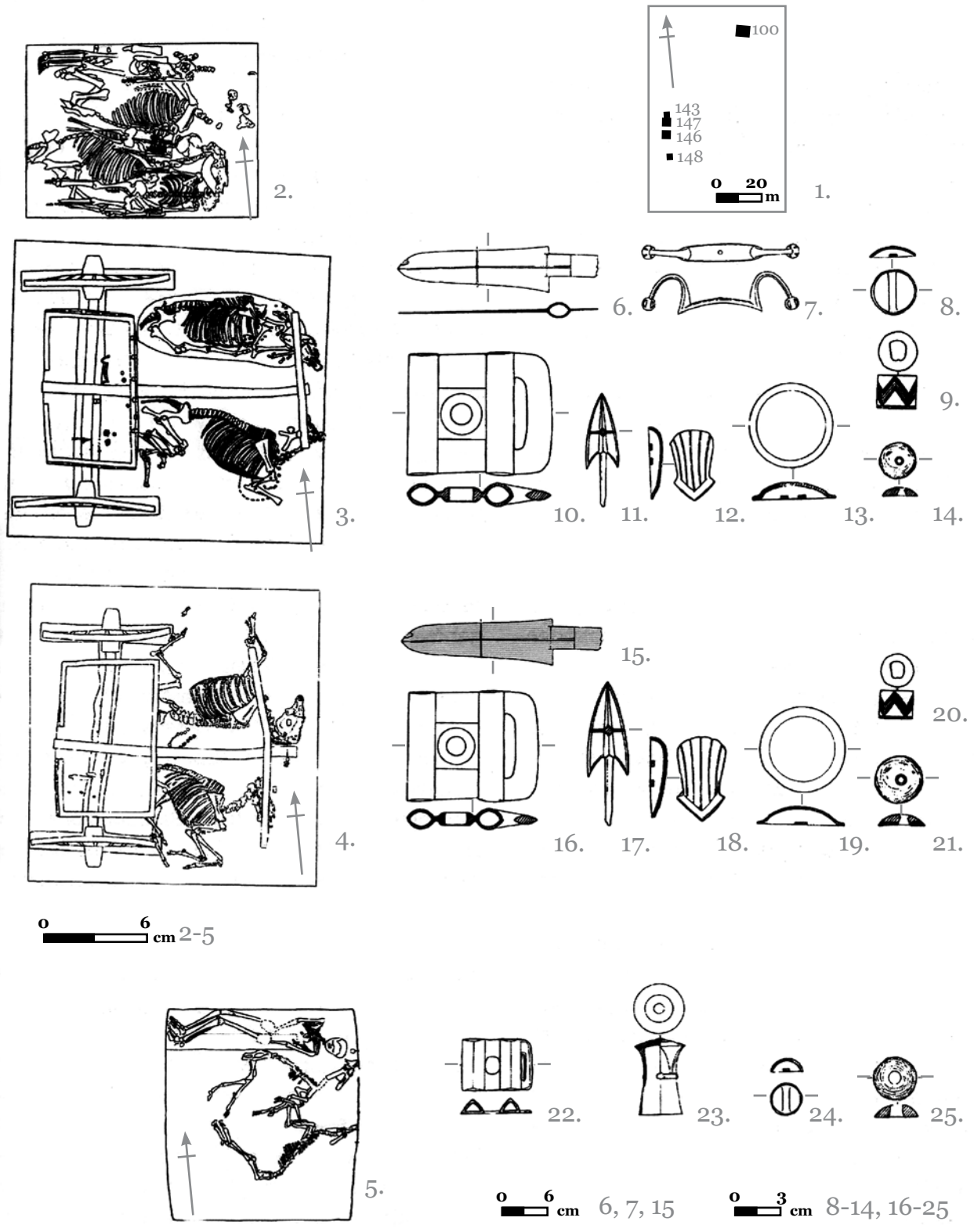


Fig. 153. Gotszyachzhuan. Position of accompanying burials 143, 146, 147, 148 relative to the main – number 160: 1 – plan (ditail); 2 – tomb143; 3 – tomb 147; 4 – tomb 146; 5 – team from the goats and the charioteer, tomb148; 6, 15 – battle axe (15 did not survive, so that only designated); 7 – a «model of the yoke»; 8, 13, 19, 24 – bronze plaques; 9, 20 – ivory tube; 10, 16, 22 – psaliis; 11, 17 – arrowheads; 12, 18 – finishing the belt as a headband boom (Psalii); 14, 21, 25 – patches from shells; 23 – bronze pommel of the yoke-saddle. [Wagner, 2004, abb. 6].

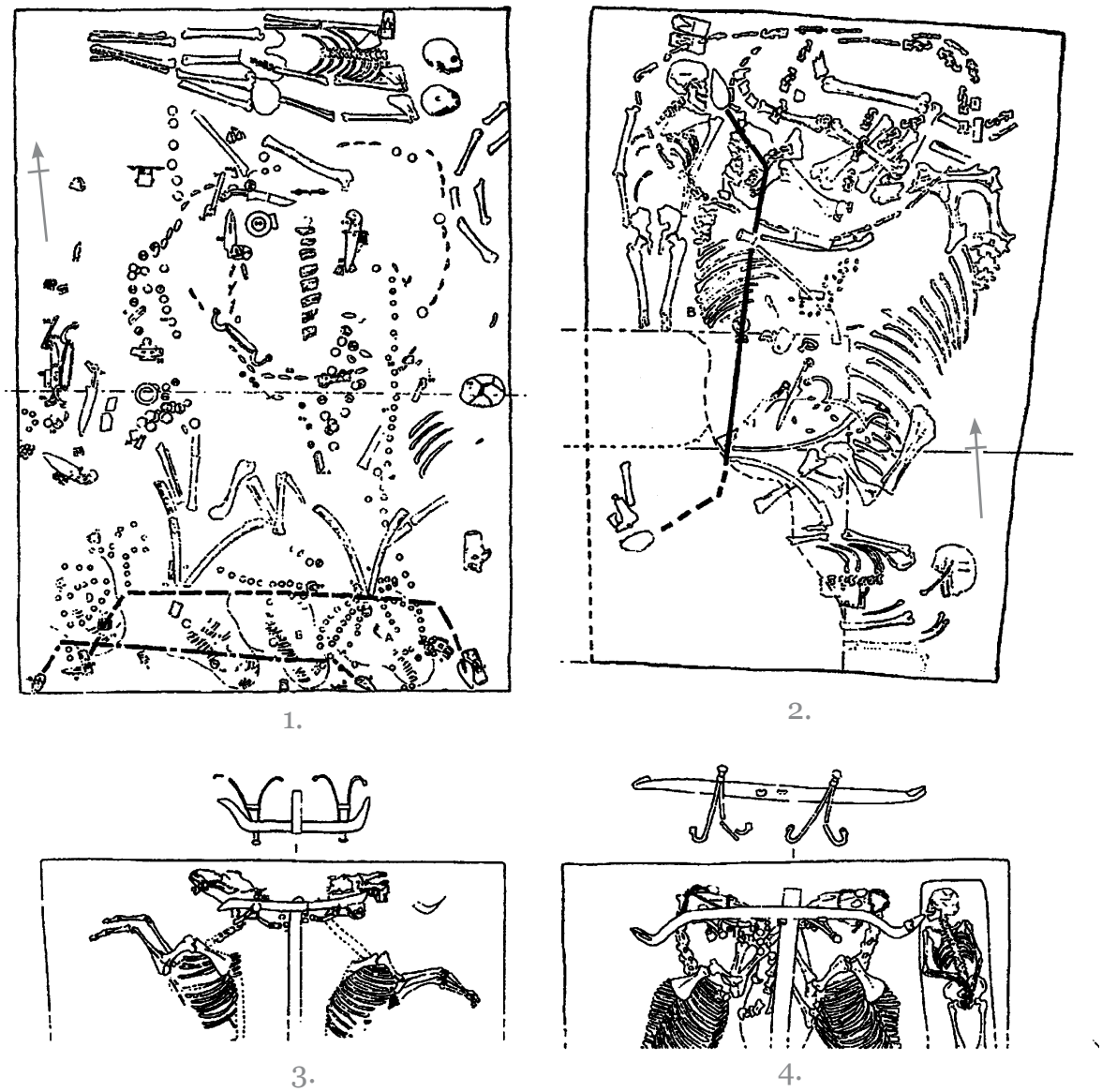


Fig. 154. Yoke with the yoke-saddle in the Yin-Shang tombs. 1 – Xiaotun, M20 (pommel yoke «henmo»); 2 – Xiaotun, M40 (pommel «henmo»); 3 – Meyyuanchzhuan, M41 (pommel «henmo»); 4 – Goutszyachzhuan, M52 (pommel «henmo») [Wu , Hsiao-yun, 2009, p. 22].

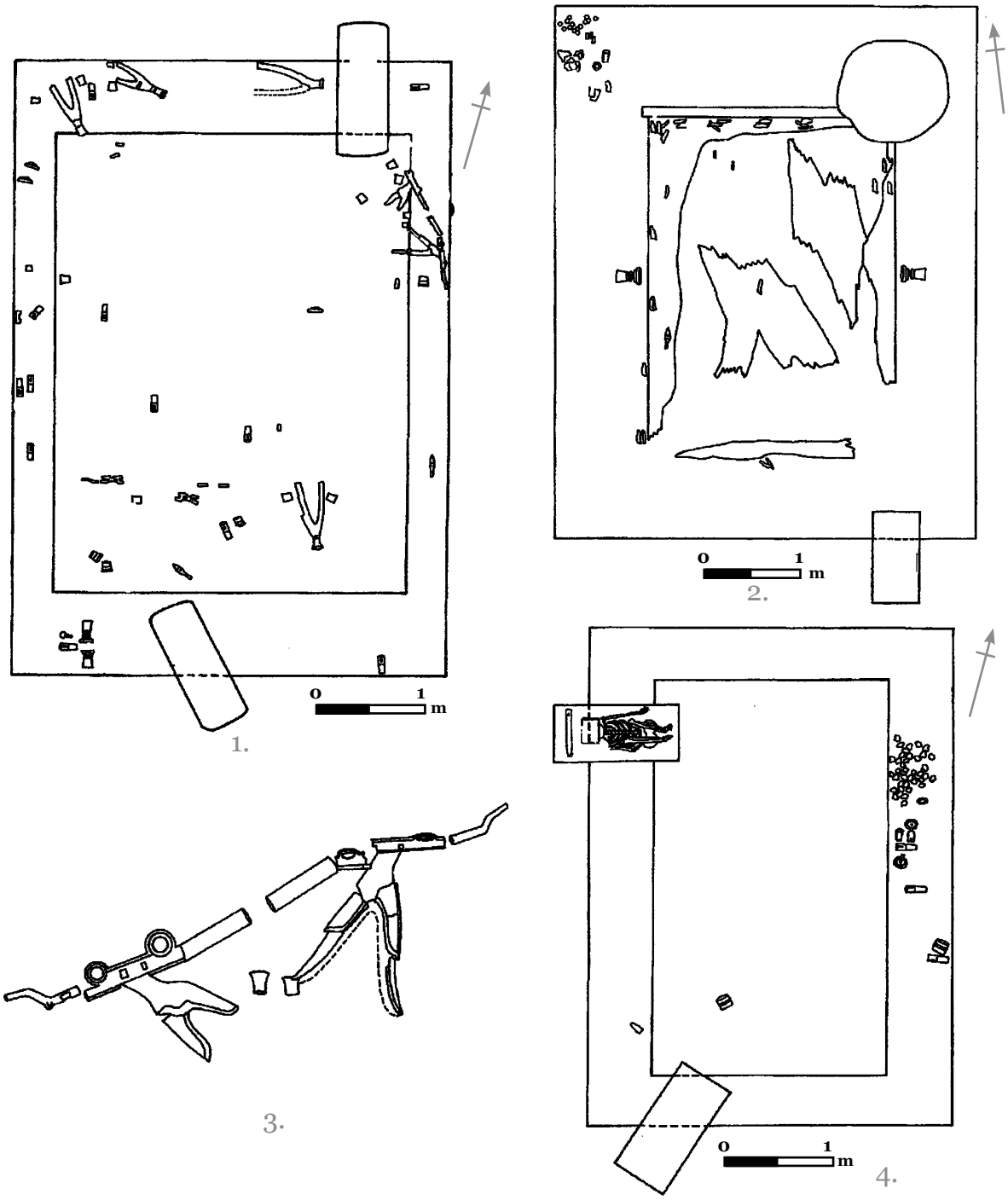


Fig. 154A. Beyyao cemetery. Final of Western Zhou. Details chariots harness, yoke with the yoke-tops and yoke-saddles. 1 – M118; 2 – M534; 3 – yoke and yoke-saddles from M118; 4 – M513 [Wu, Hsiao-yun, 2009, p. 122].

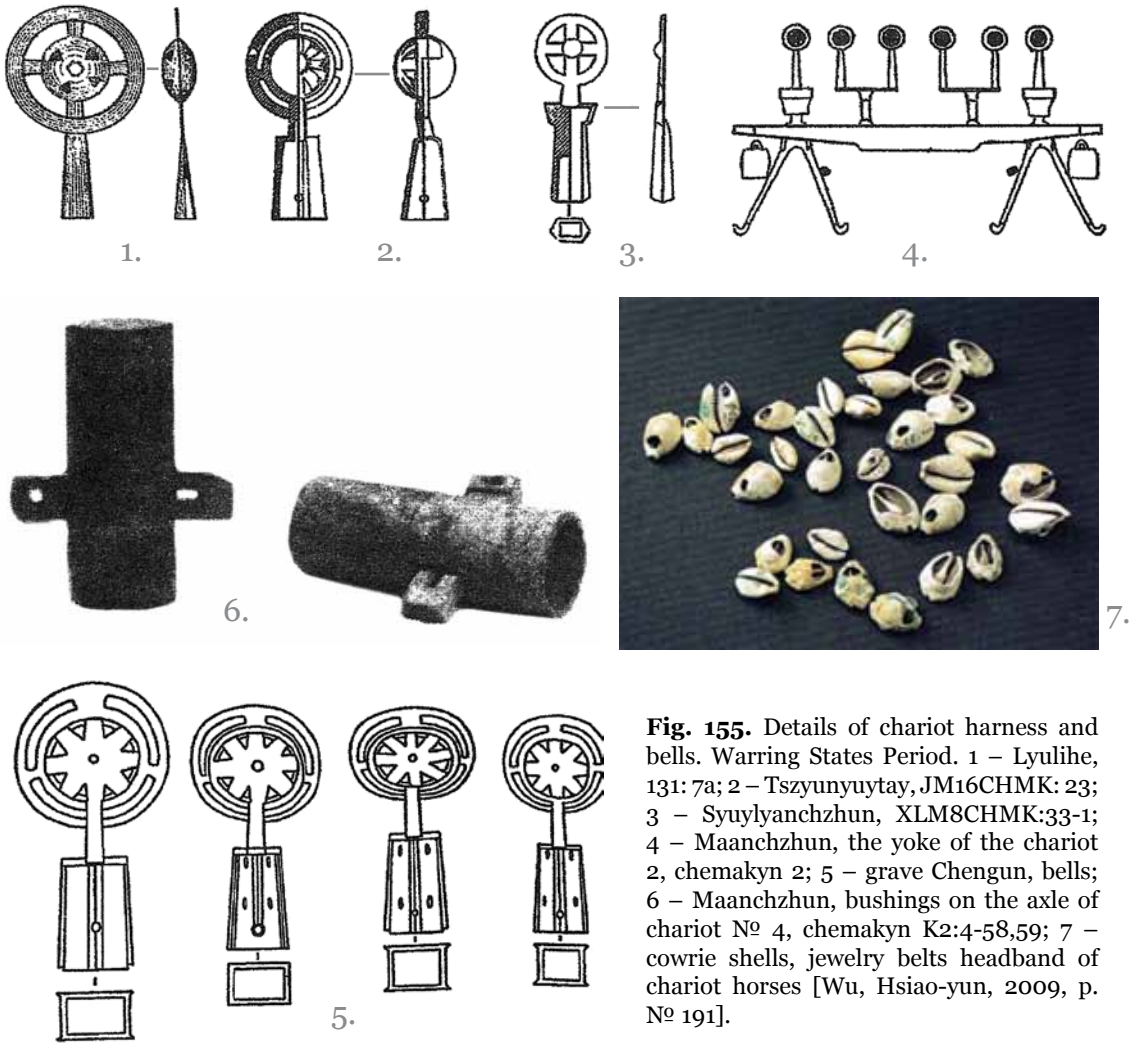


Fig. 155. Details of chariot harness and bells. Warring States Period. 1 – Lyulihe, 131: 7a; 2 – Tszyunyuytay, JM16CHMK: 23; 3 – Syuylyanchzhun, XLM8CHMK:33-1; 4 – Maanchzhun, the yoke of the chariot 2, chemakyn 2; 5 – grave Chengun, bells; 6 – Maanchzhun, bushings on the axle of chariot № 4, chemakyn K2:4-58,59; 7 – cowrie shells, jewelry belts headband of chariot horses [Wu, Hsiao-yun, 2009, p. № 191].

chariot harnesses very early, as one-part bits did not require an additional fastening with the (nose) capsule; major force in the headband straps had to be directed toward the neck.

The oldest one-part metal bits on the round or rectangular psaliis with spikes have a special loop for attaching cheek-straps. The earliest finds of this bit type occur mainly in Egypt and its subject districts. They have been found in Tel Amarna, Tel al Adzhul [Muller-Karpe, 1980, taf. 37.115], in Ugarit, Gaza, Palestine [Potratz, 1966, s. 103-116, taf. 106-109,115].

The stratigraphic position of these findings in the monuments is not clear. During excavations of Tel al-Haddad in eastern Iraq, one-part metal bits of this type were found in a layer with Kassits ceramics, which covered the Old Babylonian levels [Littauer, Crouwel, 1988, p. 169-171, fig.1]. This finding allows us to refine the dating of this type bits.

Further evolution of the Middle East (Egypt) bridle was in the use of a composite bit with a two-part mouth-piece, less painful for the horse, and of a double cheek-strap. This type is represented by

Fig. 155A. Baoji. The province of Shaanxi. Western Zhou, the average period. Details of chariots harness. Anthropomorphic tops, bronze [Shaanxi Ancient Civilization, 2008, p. 33].

exemplars from Ashur, Sialk B, grave 15, 74, Nimrud, Bogazkey, Mycenae [Littauer, Crouwel, 1979, fig. 66-70; Muller-Karpe, 1980, taf. 19,159,232].

The dating of the Middle Eastern metal bits is determined by finding from Tel al-Haddad and the Kassite ceramics. Kassites after the Hittite raid in 1595 BC captured Babylon and held it for nearly 400 years. Perhaps, the Kassites were Indo-Europeans; their rulers worshiped the Indo-European gods (Shuriya) [Bray, Trump, 1990, p. 104].

The discovery of bits from Gaza dating from the 17th century BC is associated with the Hyksos culture [Potratz, 1966, s. 109-110, 115-116].

Wheel-like cheek-pieces from Tel al-Haddad, Gaza, Amarna were dated to the second half of the 2nd millennium BC [Littauer, Crouwel, 1979, p. 86, 90, 1988, p. 169-171].

Dating of the Middle East one-part metal bits in connection with the discovery of the Tel al-Haddad, should be within the 16-13 cc. BC.

The horn psaliis in combination with organic bits in the ancient Near East were applied only by Hittites. The finds originates from the monuments of: Alagja Hüyük, Beychesultan, Boğazköy, from the layers dated to no earlier than 1450 BC [Foltiny, 1967, p. 23, fig. 5; Littauer, Crouwel, 1979, p. 88-89, fig. 50]. ■

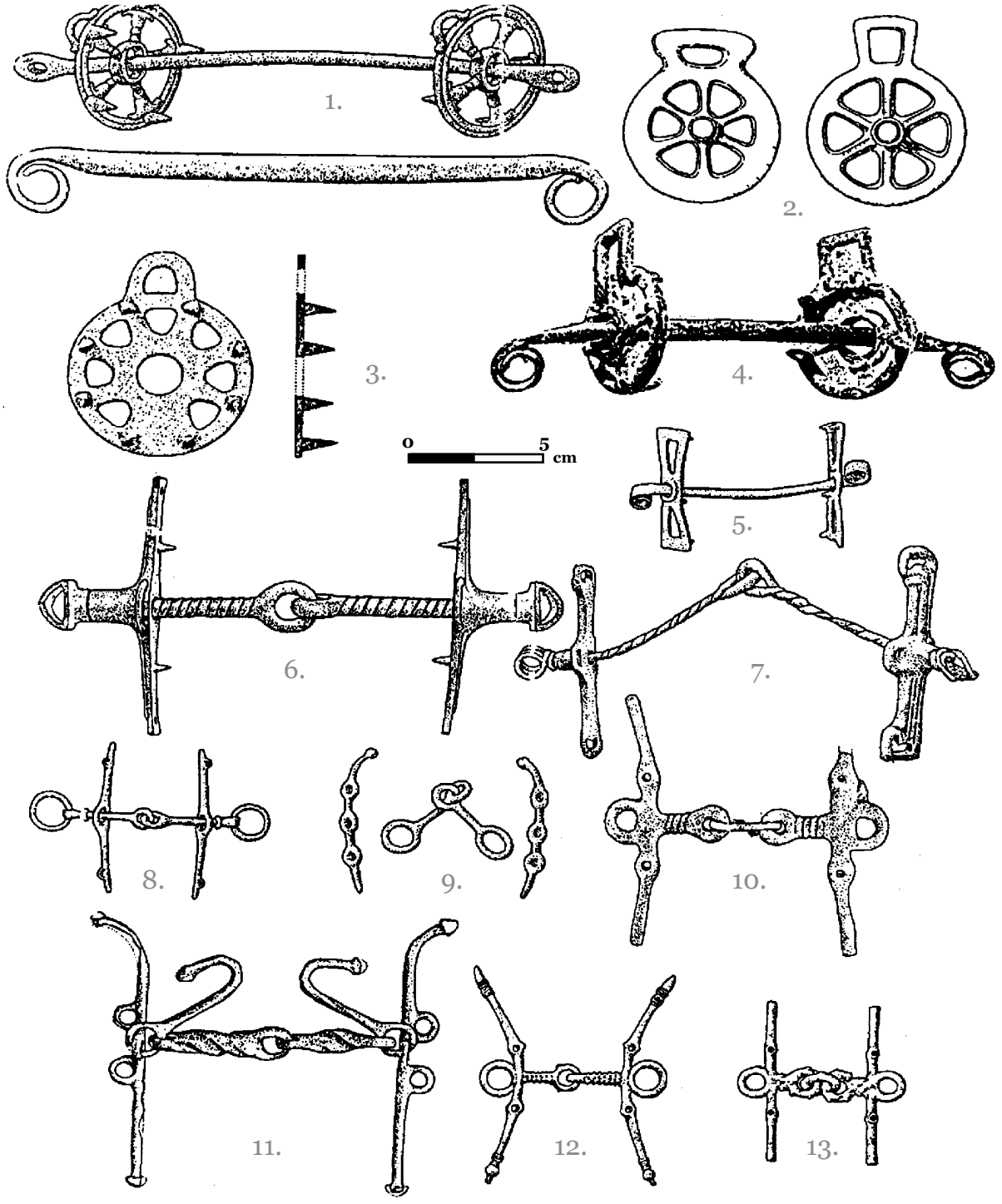


Fig. 156. Near East. Metal bits-psalii. 1 – Tell el Adzhul, Jerusalem, the Rockefeller Museum, N 37.3271; 2 – bronze psalii from Anatolia; 3 – bronze bridle and psalii, Tall al-Haddad, Iraq; 4 – bronze bridle and psalii, Metropolitan Museum of Art, N 1984.85; 5 – bronze bridle and psalii, Tang-e-Hamamlan; 6 – bronze bridle and psalii, Tell el Amarna, Oxford, Museum Ashmolian, N 1933.1209; 7 – bronze bridle and psalii, Ashur, Berlin, Museum of Pergamon, N 7284; 8 – bit and bronze psalii, Sialk-B, Grave 74; 9 – bronze bits and psalii, Sialk-B, Grave 15; 10 – bit and bronze psalii, Nimrud, London, British Museum, N 91 187; 11 – psalii and bits from iron, Boğazköy; 12,13 – bronze bridle and Psalii, Persepolis. [Littauer, Crouwel, 1979].

Complex of charioteer's weapons

According to some sources, in early period of the Asian chariot complex, a war chariot crew or a charioteer had a protective armor, a shield, a helmet, and a shot man was supplied with throwing arm of distant combat, a complex bow and arrows with a large flint heads.

For example, in the cultural layers of settlements Toksanbay in Ustiurt (Western Kazakhstan), different types of flint arrowheads, after the ceramics, make up the most abundant category of finds, that in combination with the fortification systems indicates a significant militancy of population in the region [Samashev, Ermolaeva, Loshakova, 2007, a. 87-102].

The fortified settlements of Sintashta, Archaim, as well as synchronous burial grounds revealed flint and bronze arrowheads, stone maces, clubs, bronze spears, knives and flap-butt axes. Perhaps, absence of weapons in some graves results from robbery. Judging by the inventory of the burial ground Sintashta: copper flap-butt axes, spears with open bush, adzes, two-blade knives, stone clubs and different types of arrowheads, – these are burials of warriors- charioteers.

There is reason to believe that bronze hook and goad relate to the chariot weaponry. Excavations of the mound 1 of the burial ground Aschisu, Central Kazakhstan, opened an «imitation» of a chariot burial with a perfectly preserved ornamented psalii, a bronze goad with a decorated horn bush and a bronze hook with a flare [Kukushkin, 2007, p. 40 – 63]. Further excavations revealed socket-like spear of the Seima Turbino type and a unique bronze vessel [Kukushkin, 2011, p. 110-116].

Similar goads were found in the Sintashta monuments of Bolshekaragansky and Kamenny Ambar 5 in South Urals [D.G Zdanowicz, 2002, p. 40; Epimakhov, 2005, p. 114, fig. 85:9], in burial grounds of Tanabergen 2 [West Kazakhstan, V. Tkachev, 2007, p. 30, 193-194, fig. 11:8,9] and Bozengen [Central Kazakhstan, Tkachev, A., 2002, p. 230, fig. 96:9,12]. Bronze hooks of this type are also known in the settlements and burial grounds of Sintashta [Kukushkin, 2007, p. 46], and more earlier ones – in the grave 32 with a vehicle of the Ipatov barrow, dated by radiocarbon method to the second half of the 3rd millennium BC [Belinskij, Kalmykov, 2004, s. 201-220, abb. 14]. Apparently, these hooks became a «prototype» of later chisel axes with a hook on a long handle, well known by Chinese findings from the «northern complex».

Fixing of «the yoke models» buckles to a charioteer's belt implies some rigid framework, for example, a protective armor, over which such belt with the buckle could be worn. Remains of the protective armor were found in the Rostovka burial ground of Seima Turbino, where the bony plates up to 40 cm long, covering this armor, were cleared [Matyuschenko, Sinitsyna, 1988, p. 11-12, fig. 9-10]. At the Kamenny Ambar 5 burial ground, mound 2, tomb pit 1, protective bony plates of armor also were found, the same as in Rostovka [Epimakhov, 2005, fig. 13, photo 9].

In the Zhou time, the chariot weaponry included a shield, along with bows, spears, chisel-axes, daggers. In the burial ground Chzhanzyaopo, chemakyn no.155, together with bronze plaques, wands' tops (?), and fish figurines from shells, a sub-square lacquered wooden shield with bronze plating, was found

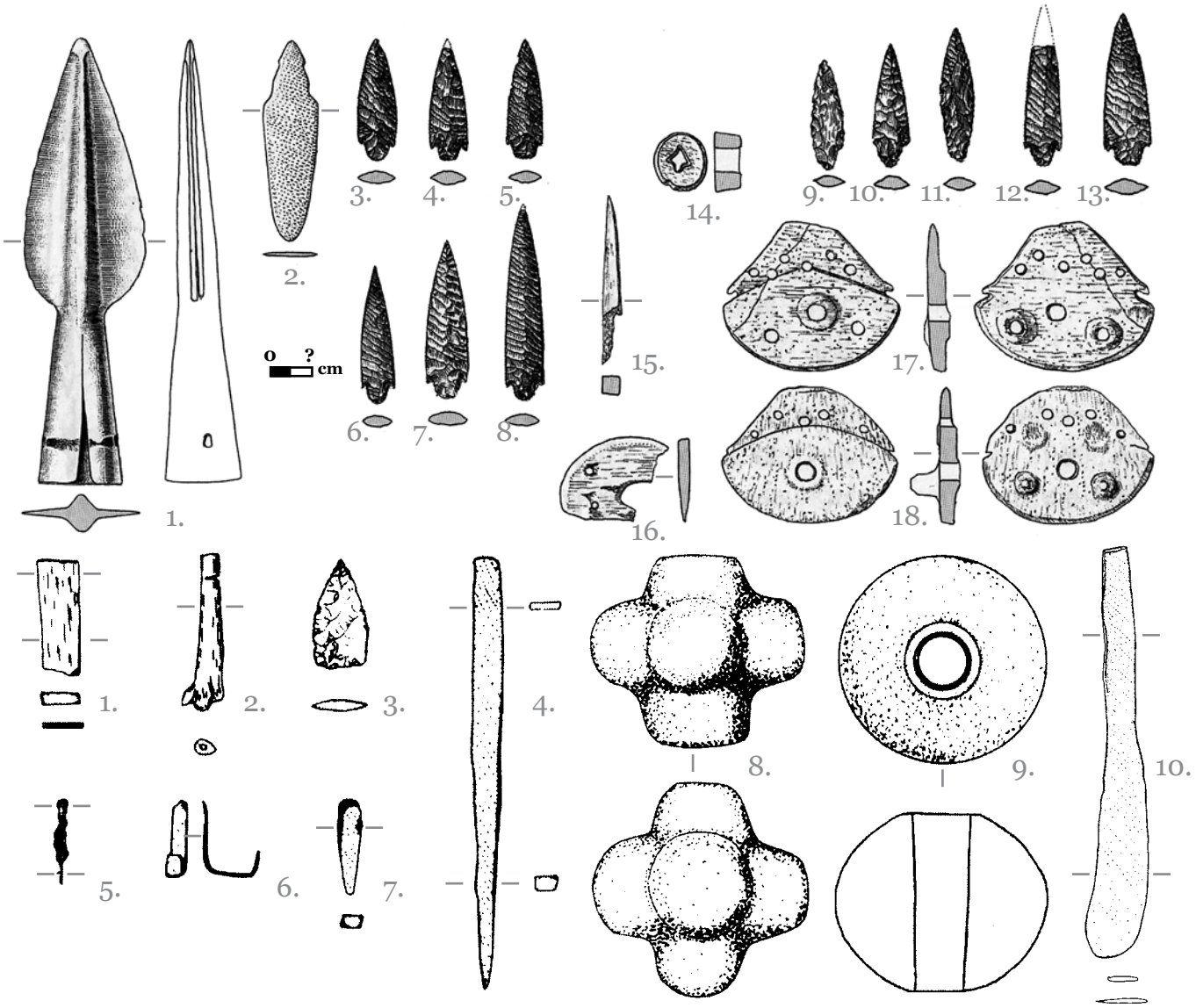
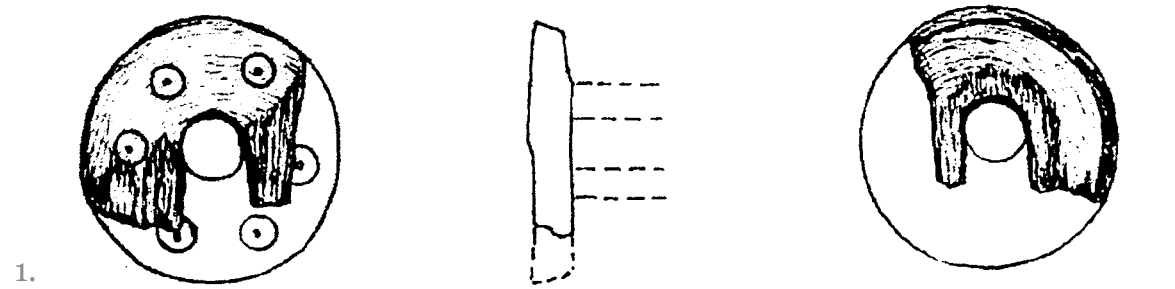


Fig. 157. Ural-Kazakhstan chariots complex. Inventory: 1-18 – Sintashta, grave 30: 1-2-bronze; 3-13-stone; 14-18-horn. 1-10 – Kamennyi Ambar 5, barrow 2, grave 8: 1-2 – bone; 3, 8, 9 – stone; 10 – bronze. [Epimachov, Korjakova, 2004, s. 226, 229, abb. 5,8].

with 1 sq. m of total area (Fig. 120:4). A standard set of the Qin Shi Huang chariot included a magnificent bronze shield of much lesser size.

There are human figures depicted on some of Yin and Zhou «the yoke models», with horns or rays off the head, exactly the same as on the jade figurines of people [Kozhin, 1990, p. 47]. For all the original iconography of these images, they seem to be associated with the steppe tradition.

Interesting in this sense is the collection of Yin helmets (over 140 copies) [Varionov, 1990, p. 56-66]. The rounded top of the helmet surmounted by a tube for mounting a plume, the face part, as a rule, is ornamented and decorated with stylized animal faces (a tao-te mask). A. Varionov suggests that a prototype of the helmet could be a ritual mask or leather (felt) a headdress decorated with embossed or carved image.



1.

2.

3.

4.

Fig. 157A. Central Kazakhstan. Aschisu: 1,3 – goad with horny clutch and bronze tipped; 2 – hook from the Aschisu [Kukushkin, 2007, p. 52, 61, 62, fig.15-17]. 4 – spear-stamp on the long arm of the funerary complex of Qin Shihuang. The front side bears the inscription «made by Lu Buwei», on the back – the hieroglyphes «sygun» – the name of the institution, the head of manufacturing weapons and chariots [Qin Wen, 2008, p.66].

Rather, the tradition of using masks for ritual and war practices was a reason for finding such masks in graves, as burial masks, in such mutually distant regions as China and Ancient Greece. Decoration of chariot complex items – chariots, weapons, «the yoke models» – by animal masks is indicative of their wide spread in the steppe environment too. The pictorial sources show a large series of «sun-headed» anthropomorphic characters and masks which could be juxtaposed with such masks (Fig. 87-89, 91-92, see details in the next Chapter).

Pictorial monuments

Bronze Age petroglyphs illustrate the weaponry complex of this time: spears, clubs, chisel-axes, dagger-knives and various types of bows. Thus, the Baikonur petroglyphs cover all these complex elements, including an interesting spear in the scene of confronting the bull (Fig. 94, 157).

Lance. Among the petroglyphs of Kurchum in the Eastern Kazakhstan, a soldier on foot, in a peculiar head-dress, with a tail-like thing attached to his belt, holds with both hands a spear of a short shaft and a triangular tip. Judging by the iconographic features, images of an anthropomorphic character with a spear relate to the Seima Turbino [Samashev, 1992, fig. 105].

Mace clubs. Images of human with mace clubs are most often found in the monuments of Southern Kazakhstan, Sary Arka, Tarbagatai and Tamgaly. The general feature is the mace tossed on shoulder with the war-

Fig. 157B. China.The complex of armament and protection of the charioteer. 1 – bronze spear (the period of the Shang) from Shentszyun; Qinghai Province; 2 – bronze axe «chi» of the cemetery near the village of Hedge, a tomb 1, county Tsishan (late Shang); 3 – decorated with a bronze axe from the museum collection, the Xi'an (Western Zhou) [Shaanxi Ancient Civilization, 2008, p. 20, 31], 4 – 6 – Qin Shihuang funerary complex: patterns of arms (4), stone armor (5-6), sickle-hooks on the axis of the chariots (7) [Qin Wen, 2009, p. 41].

Fig. 157C. China. Anthropomorphic small plastics and masks. Shang-Yin. [China: History and Civilization, 2007, p. 6, 11, 22-23, 30].

Fig. 157D. Kazakh Melkosopochnik. Petroglyphs in the valley of Baikonur river. The scene of confrontation of man with a spear and a bull.

head tipped back, apparently, the usual way of carrying it; men with maces are depicted with knees bent, feet pointing forward, the «tail» sometimes with a node at the tip, the primary male sign emphasized [Murgabaev, Eleuov, Samashev, 2006, p. 69; Rogozhinskiy, 2001, p. 29].

Bows. The most abundant image known throughout the range of spread of petroglyphs; the design poorly distinguished, various in size.

Dagger knives. Bronze knives of the Bronze Age are frequent images in petroglyphs of Europe. In the north-eastern spur of the Karatau range, on the Ters River bank two rare images of daggers were discovered, in full size. One repeats a pattern well known in China, the other is classic for the Kazakhstan settlement of final Bronze period of 13-10 cc. BC [Samashev, 2006, p. 178].

Shields. A scene of two foot warriors fighting with maces from the Sagyr-2 site in Eastern Kazakhstan is interesting by the fact that men have shields on their backs [Samashev, 1992, p. 29, 2006, p. 105]. The shields remind those from the Chinese chemakyns. It is supposed that these wicker shields of straight-grained branches laid crosswise, covered with damp skin, were a reliable protection from hits, even safe from spear breaks [Soloviev, 2003, p. 30, p. 41]. The composition above includes images of horses in the style of the Seima Turbino tradition.

The tactics of the chariot battle

Reconstruction of the Shang-Yin tactics of the chariot battle (ris.158) is based on a comprehensive analysis of armaments and their combat properties [Jam, 1990, p. 56-72]. The author believes that the main function of chariot units was to fire arrows on an enemy infantry from a distance of 30 to 100 m. Together with own infantry units, they had to prevent a breakthrough of enemy chariots to the flanks [see: Gorelik, 1985, p. 183-193].

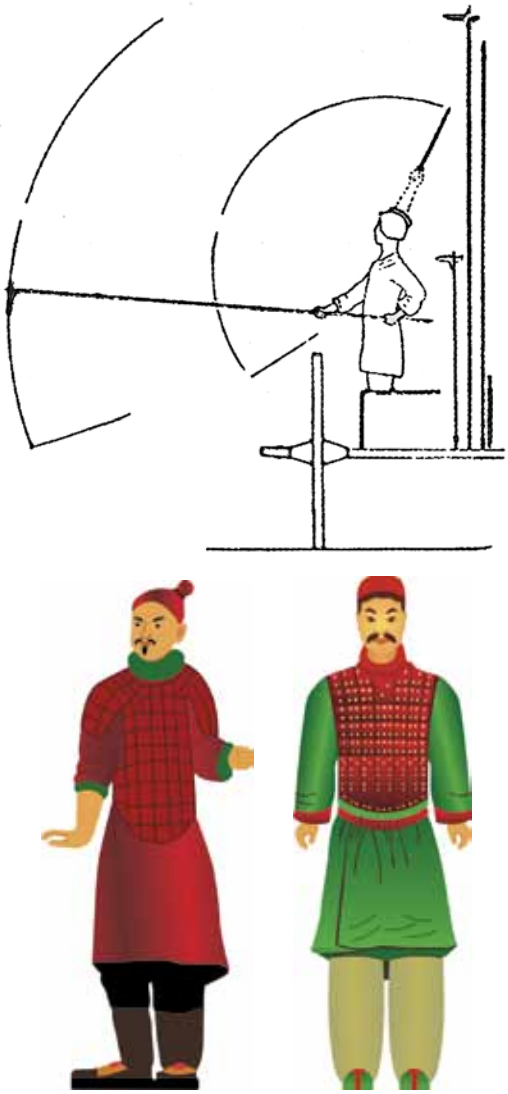


Fig. 158. Scheme of complex use of weapons in the chariot and the reconstruction of charioteer's costumes based on the evidence from the burial complex of Emperor Qin Shihuang.

Opening of the terracotta army of the Emperor Qin Shi Huang and his chariots gives a wealth of information about the structure of military units, in which warriors and chariots are arranged in a certain order and disposition (Fig. 158-160).

The largest of the three excavated crypts, the first, extending 230 m from west to east and 62 m from north to south, revealed more than 6,000 figures of warriors, horsemen and 40 wooden chariots, arranged in a rectangle military formation. The first three rows are of 68 men each; foot soldiers are at the forefront armed with bows or crossbows, with a quiver of arrows behind the shoulders. Next to the vanguard are a sheltered infantry and chariots assigned to each unit. The edges of the military formation are occupied by the lateral forces, whose task is to cover the flanks of the army. The rearguard of three rows of armed archers closes the formation. Chariots are drawn by four horses, with wheels 135 cm in diameter and 30 spokes. Two charioteers in armor are standing or walking behind their chariot, are always accompanied by a soldier in the same uniform, could be a squire of the charioteers.

A quadriga chariot was found in the crypt no.3, interpreted as a command post; upon the analysis of the surviving remains of decoration and the umbrella, the chariot was defined as a commander's quadriga, and is followed by officers.

The crypt no.2, 20 m to north-east from the crypt no.1, 124 m by 98 m, contains 89 chariots and 350 harnessed horses, 900 statues of foot and mounted warriors. This crypt is interpreted as a chariot storage place. It is noteworthy that the construction of the crypt is a huge dugout barn, on top overlaid with wooden beams, covered with mats and skins. According to the Vedic texts, in India, to store chariots it was required to arrange the ground sheds with the floor grooves for the wheels.

The chariot army consists of crossbowmen, an infantry, surrounding a chariot; the army is closed by 108 horsemen and six chariots.

The army is a powerful strike force, designed for fulminous attacks on enemy. The chariot crew consists of three men: a charioteer and two warriors.

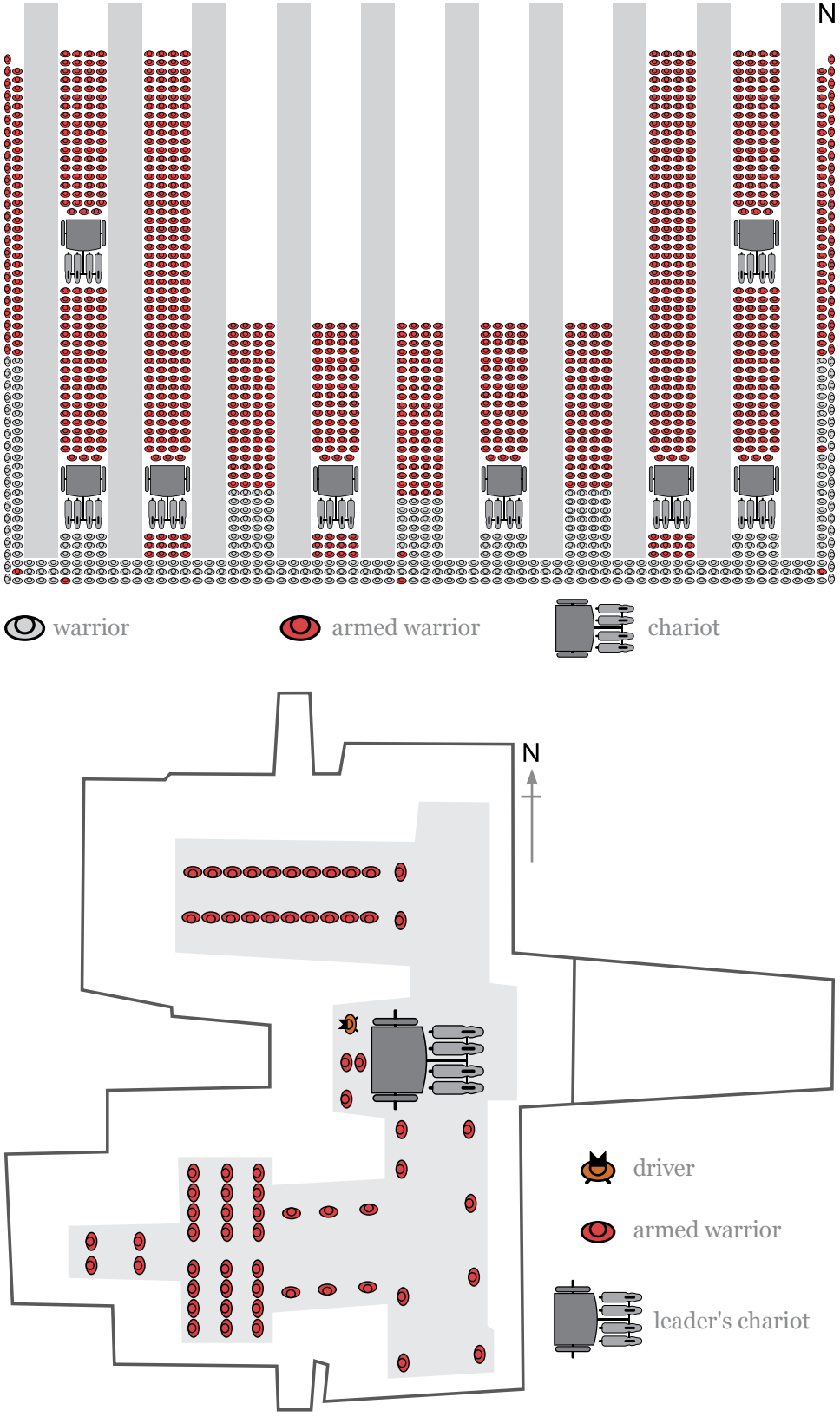


Fig. 159. China. Qin Shihuang funerary complex. Schemes of vaults 1 and 3 [Qin Wen, 2009, p. 48, 83].

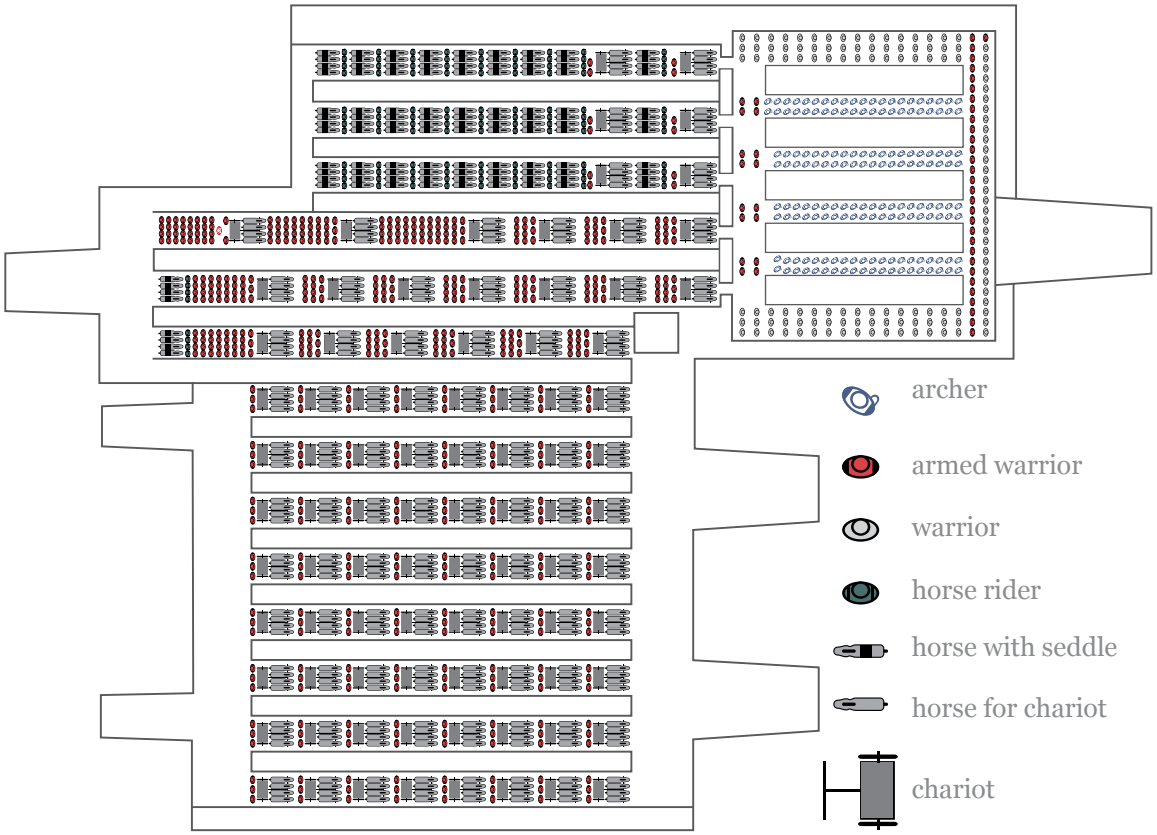


Fig. 160. China. Qin Shihuang funerary complex. The scheme of the vault 2 [Qin Wen, 2009, p. 70].

In 1998, a new crypt was discovered, with more than 90 stone and metal armor and more than 30 stone helmets [Qin Wen, 2009, p. 41, 67]. In addition, the monument materials fix bronze «sickles», attached to the axis of a quadriga chariot, and, similar to the late Achaemenid chariots, mowed down the ranks of the enemy's infantry, disorganizing and disrupting the enemy's combat system [Nefedkin, 1997, p. 10, 2001].

Thus, in chariots of the Tsing period (220-235 BC) functioned as the commander crew, a command center of separate infantry divisions, a battlefield transport, and a powerful quick strike force, destroying the enemy's formation, integrated into a single unit together with few horsemen.

A primary chariot weapon for distant combat is the bow, crossbow; for close combat: a spear, a hook, a chisel ax on a long handle, in a melee: a sword, a dagger knife, an ax, a mace. There are more than 30,000 units of various types of weapons excavated so far [Qin Wen, 2009, p. 89]. ■

Features of the funeral rite

The steppe and Chinese chariot complexes significantly match in fragments of the funeral rite, namely: special wheel grooves; cult burials of dogs; fish cult; some horse sacrifices; a pair of horses laid together with parts of a chariot equipment, psaliis; mounds with chariots have a special arrangement; only men are buried in the mounds, meaning an existence of a special class, of charioteers.

There are also other features: absence of weapons in graves (with rare exceptions), decoration of vehicles' body boards and important parts, special grooves for wheels in the bottom of graves, which, however, were not used: a chariot was placed nearby, and its wheels were not inserted in the grooves [Kucera, 1977, p.135-140]. Thus, there is an «imitation» of a chariot burial fixed in the steppe tradition.

There is a similarity between the main technical parameters of Yin and Zhou chariots and that of the steppe, besides, size of wheels and the width of the wheelbase of the former exceeds those of the latter.

In China, in contrast to the steppes, the wheeled vehicle manufacturing tradition is not fixed in synchronous and earlier monuments; at a later time innovations or invention of a four-wheeled vehicles did not happen. What did happen in China was appearance of threatening war chariots with the «sickles» and of representative carriages with umbrellas, as well as increase in the body of the chariot and its turn into a cargo or passenger two-wheeled covered wagons.

The written sources record the bloody custom of human sacrifice and violent slave burial in all early Chinese dynasties: a governor's concubines who did not give birth to children, prisoners and slaves. Many circumstances of the burial rite of steppe graves with chariots unequivocally indicate the existence of such a custom [Gening, Zdanowicz, Gening, 1992, p. 210 et seq.].

A steppe tradition of making bronze sacrificial vessels, recorded in the chariot materials of the burial ground Aschisu, is further developed in the Early Chinese bronze casting «industry», which resulted in the mass production of the magnificent bronze vessels of various kinds.

A bright proof of the advancement of steppe societies to east is a large series of mummies of Caucasoid appearance and numerous series of burial grounds found in the Tarim desert, the Taklamakan lowlands, in the Xinjiang Uygur Autonomous Region of China, exhibited today in a special hall of the Urumqi Historical Museum.

The monuments are located on the same routes, where later the Great Silk Road passed. Excavation of the numerous burial grounds in this series (Fig. 161) gives unique information about the migration. The ceramic complex, features of the ritual and funerary structures allowed dating these monuments to 18-17 cc. BC.

K. Yetmar, analyzing the Gumugou burial ground materials, located in the northwestern part of Xinjiang, supposes their identification with Caucasians, proto-Tokharians, migrated here from western parts of Eurasia around 1500 BC, whose material culture have some features characteristic to natives of the Karakol Afanasievo culture of Altai [Kubarev, 2006, p. 49]. Women's clothing preserved in these tombs is very similar to those reconstructed by E. R. Usmanova by Alakul' and Andronovo women's suits and jewelry [2010].

The climatic conditions of the desert «mothballed» many artifacts inaccessible in the steppe archeology, such as clothes,

nice dresses in red, wool and pelts painted by mineral dyes, and numerous wooden objects and things (Fig. 162).

Based on the above said, it is advisable to consider the steppe and Chinese complexes as a single Asian chariots complex, and to regard existing differences as chronological. This chariot complex was focused on the Botai horse domestication center.

A related chariot complex, oriented, obviously, on horses from other horse domestication center of the Dereivka – Repin Khutor developed in the European part of the steppe Eurasia based on the Don-Volga tradition [see: Anthony, Vinogradov, 1995; Vinogradov, 2000, 2003].

V. Tkachev, suggests that these were two originally separate, permanently interacting chariot cultural areas [Tkachev, 2007, c. 290-291], which seems to be doubtful. Completely isolated and developing independently on own traditions and innovations was the Egyptian chariots complex. Clash of these very different Asian and Egyptian chariot traditions, was documented by the largest chariot battles at Kadesh and Megiddo. ■

Fig. 161. Xinjiang. Findings of the monuments in the south and middle branches of the Silk Road. 1 – Xiaohe cemetery, culture Lop Nor III, a general view of the 4 and 5 levels; 2 – Vupu, western suburb of the city of Hami, wooden wheel with a diameter of 79 cm, 14.5 cm thick, found on the ceiling of the tomb; 3 – Gumugou, culture Lop Nor II, female mummy discovered in 1978; 4 – Xiaohe, culture Lop Nor III, a mummy in a wooden sarcophagus of the two arched panels without a bottom and lid; 5 – Tebanhe tomb, the mummy known as the «Loulyan Beauty»; 6 – Xiaohe cemetery, the head of a bull, a painted black and red stripes, was found in one of the sarcophag.[Qi Xiaoshan, Wang bo, 2008, p.22-25, 27,92, fig. 7,3,9,10,4].

Fig. 161A. Xinjiang. Ceramic sand bronze.
1,3 – Liushui Cemetery (Liushui culture, 10 cent. BC, H. – 10,2 sm, diam. - 10,1 sm (1) and H. – 7,6 sm, diam. – 7,2 sm (3); 2 – Qiemurqik semetery, is locatedin a basin 12 km south west of Altay city, H. – 22 sm, diam. – 17,3 sm; 4 – Tienshan Beilu cemetery in Hamicity, grave 214, H. – 15,9 sm, diam. – 11,2 sm (19-13 cc BC); 5,6,7 – Xiabandi cemetery in Taxkorgan: bronze bracelets (diam. 5,5 – 6,3 sm), bronse earrings (diam. 3,3 – 3,1 sm) and pottery jar, H. – 10, 5 sm, diam. 14 sm; 8 – Xiangbaobao cemetery in Taxkorgan, H. – 10 sm, diam. – 10,5 sm (period Spring and Autumn); 9,10 – on the west bank of Manas river, 5 km north of Shihezy city, cemetery at the cement plant. Pottery jar and bowl: H. – 14,7 sm, diam. – 16,2 sm (9) and H. – 8,2, diam. – 15 sm (10) [Qi Xiaoshan, Wang bo, 2008, p.59, 89, 184, 216, 222-223, fig. 2, 4, 5, 6, 7, 9, 10].

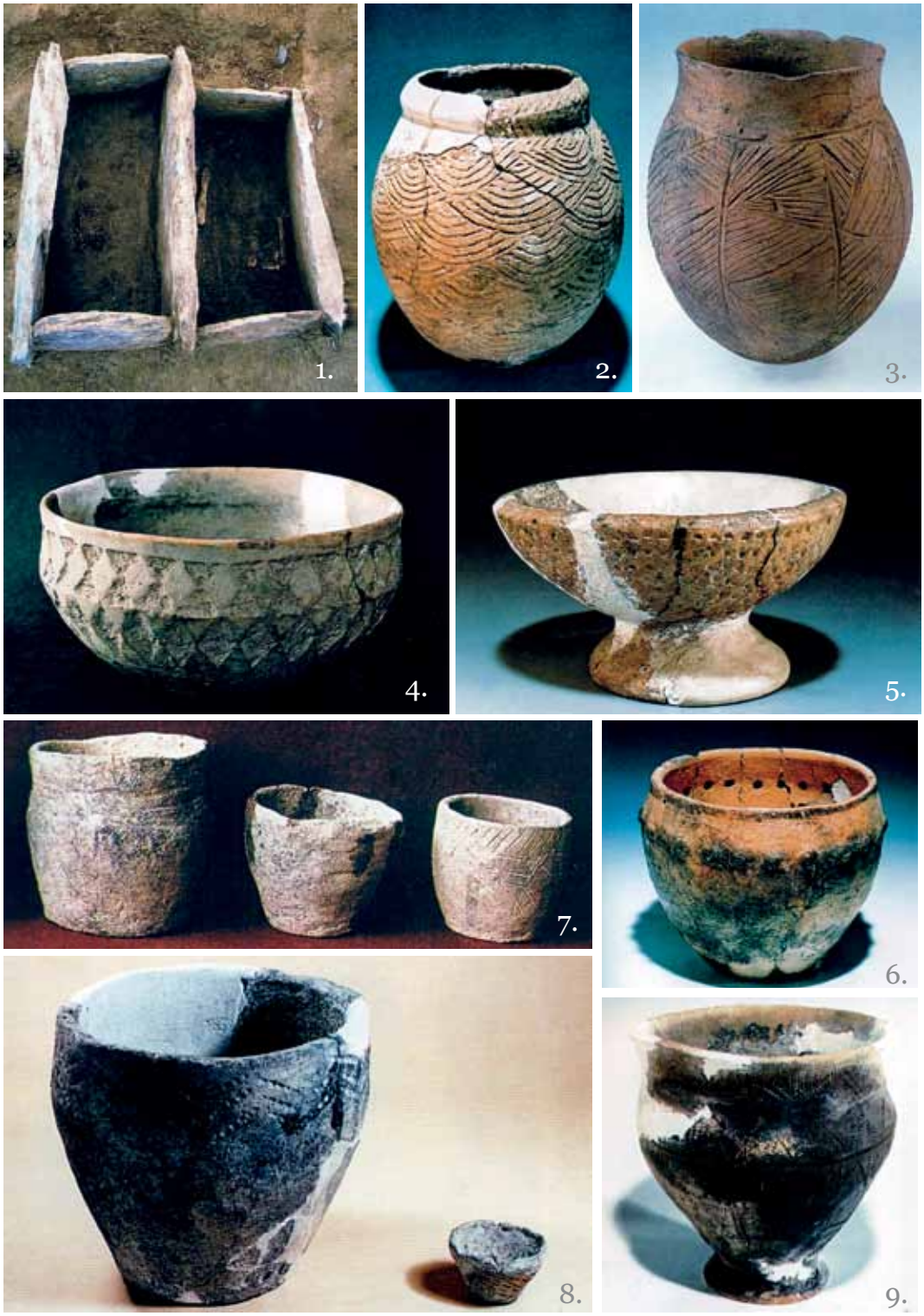


Fig. 161B. Xinjiang. Findings on the routes of the Silk Road. 1, 7, 8 – Tacheng Weysyao (city Tacheng, in the School of Health), excavated 19 burials in stone boxes and vessels decorated with ornamental comb, Andronovo type; 2, 5 – Tsimurtsig cemetery, a vessel in the form of olives from the grave 16, height 17 cm, diameter of 9 cm and a bowl on the tray from the grave 24, height 8.3 cm, diameter 14.3 cm; 4, 6 – burial site on the west bank of the river Manas, near the city Shihetszy, vessels with «pearls» and a bowl, a height of 6 cm, 18 cm in diameter; 3 – vessel from Burchin County, near the city Altai, height 20 cm; 9 – Satszy cemetery, county Tolley, height 16.6 cm.[Qi Xiaoshan, Wang bo, 2008, p. 216-217, 222, 227, 231-232, fig. 2,5].

Fig. 161C. Xinjiang. 1 – Bortal county, Venguan river, the general view of a rectangular fence; 2 – valley of Ili river, Nilka county, vessel, height 17 cm, 20 cm – diameter; 3 – Tacheng Veysyao (northern suburb of Tacheng), a fragment of pottery; 4 – valley of Ili river, a suburb of Tsyaolakerek, bronze knives, daggers; 5 – bronze dagger with pommel, found in Tacheng, length 33.5 cm; 6, 7 – burial site on the bank of Kyzyl reservoir, bronze axe and a knife (23 to 13.4 cm in length); 8 – Yanghay cemetery, wooden bucket, height 16.4 cm, diameter 13.2 cm.[Qi Xiaoshan, Wang bo, 2008, p. 105, 148, 230, 233, 238, 244].

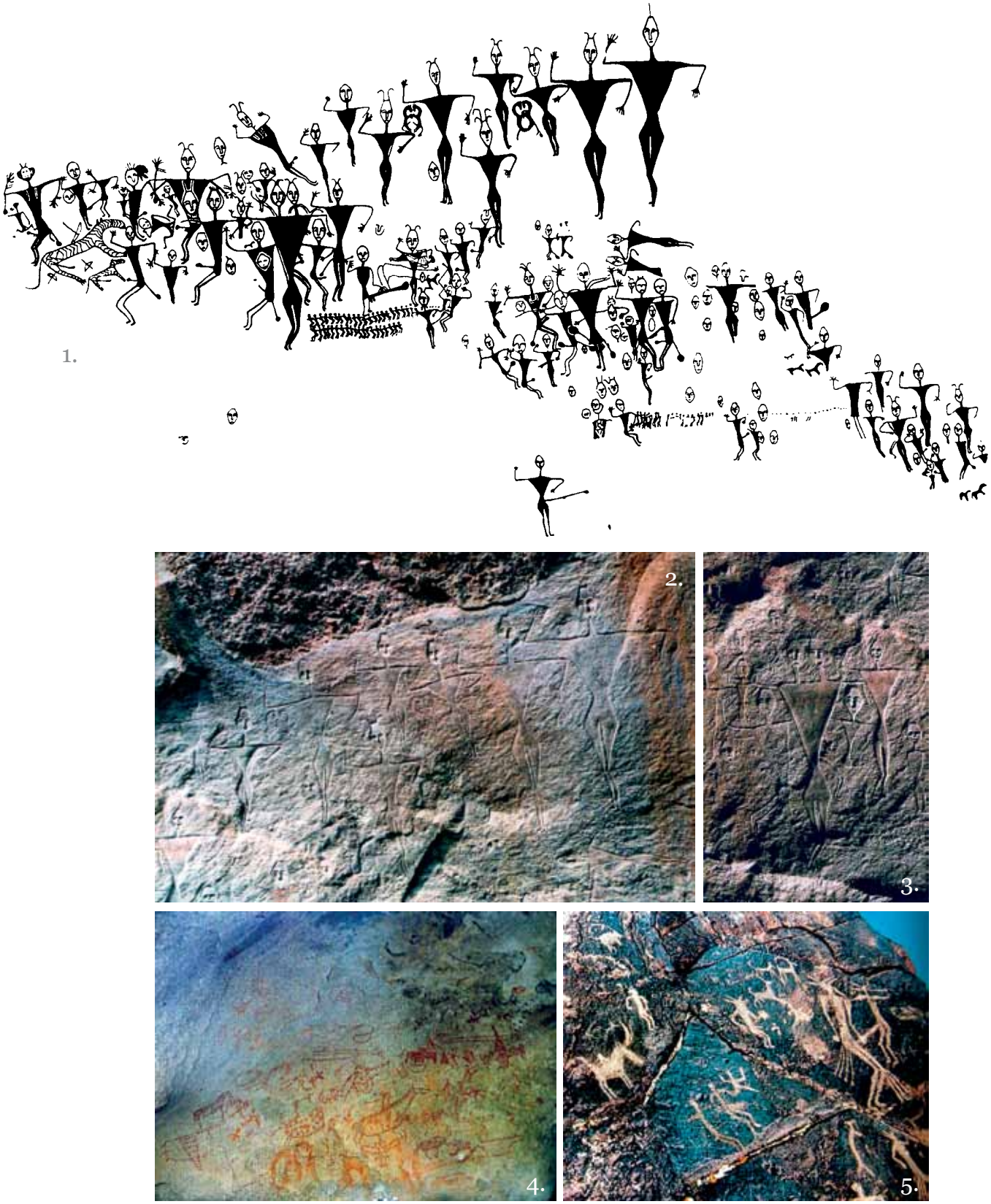


Fig. 161D. Xinjiang. Petroglyphs. 1-3 – spurs of the Tian Shan Mountains, county Hutubi, site Kangzhiashmientszy; 4 – Altai Mountains, site Dugat, county Habahe, paintings; 5 – Mount Bayerdauker, county Yamin [Qi Xiaoshan, Wang bo, 2008, p.214-215, 224 , 234, fig.1-4, 6,8,3,2].

Dating of the Asian chariot complex and the chronological priority

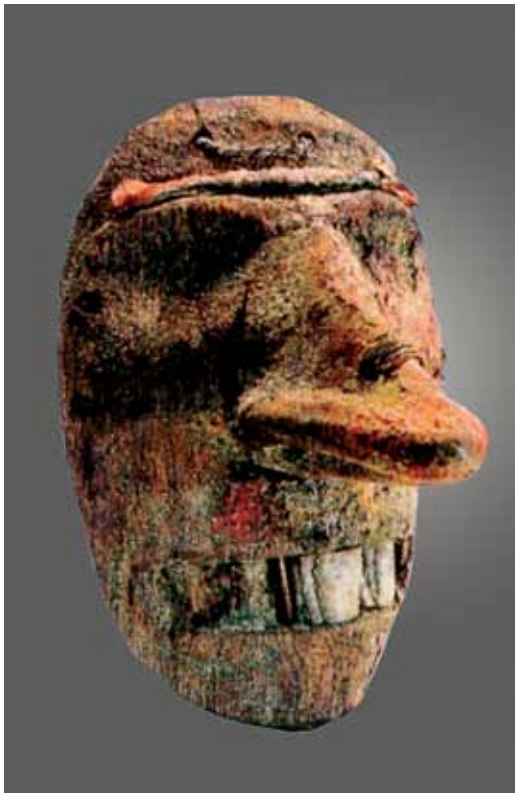


Fig. 162. Xinjiang. Historical Museum Urumqi. «Mask of Ashwins – Nasatia». Wood, mineral paints. Height – 8.7 cm. Found in the cemetery Xiaohe, culture Lop Nor III. [Qi Xiaoshan, Wang bo, 2008, p. 24, fig. 4].

In recent years, the radiocarbon dating technique got much improved, thanks to calibration of radiocarbon dates with the dendrochronological scale. This circumstance led to the «antiquating» of many historical events in the Ancient World, to revision of some established ideas, which was met with aversion from some researchers. Like any innovation, this technique during its development had many flaws and was rightly criticized. However, there is no need to reject the old and tested «method of domino» for search of dated analogies and construction of the relative and the absolute chronologies. In this matter, only the quantity could give so badly needed quality.

Therefore the problem of synchronization of artifacts and related events in remote regions of Eurasia directly depends on large series of calibrated radiocarbon dates and a uniform laboratory method of processing the results. Their combination with the data of written sources in China can correlate ancient history of chariotry in China, known at present mainly by fairly accurate dates of the rein of dynasties and the individual rulers, recorded in history books.

In search of a chronological benchmark, for many years in the historiography of the Eurasian steppe antiquities, majority of researchers focused on the well-studied artifacts from the IV shaft tombs at Mycenae, materials of which were well dated by stratigraphic techniques and by written sources. For very long, a date of 1550-1570 years BC became monumentally bronze in its grandeur [Kuzmina, 1994; Anthony, Vinogradov, 1995; Littauer, Crowel, 1996]. A recent publication of a series of calibrated radiocarbon dates allowed revising the stereotype [Epimakhov, Hanks, Renfrew, 2005; Horses, chariots, ..., 2010].

The series consists of 39 dates for Sintashta monuments, 17 for Petrovka, and 33 for Alakul'. Their calibration by the dendrochronological scale was implemented with the program OxCal 3.10.

The boundaries of the series in absolute values are set as follows:

Sintashta dates: 2040-1690 BC (68.2%) and 2900-1500 BC (95.4%) upon verification by 15 reference dates of the Arizona and Oxford laboratories became respectively 1970-1770 BC (68.2%) and 2030-1750 BC (95.4%), which corresponds to the end of the 21-18th cc. BC

Petrovo dates: 2500-2250 BC (13.6%) and 1950-1500 BC (54.6%); the authors are in favor of later dates due to inhomogeneity of this series, since six dates of the Oxford laboratory converge quite well: 1880-1740 BC (68.2%) and 1930-1690 BC (95.4%), which correspond to 20-17 cc. BC. For monuments of Trans-Ural, Petrovka stratigraphic layers were fixed above that of Sintashta [Tkachev, 2002; Vinogradov, 2003, 2004].

Alakul' dates: 2500-2000 BC (39.7%) and 1750-1500 BC (28.5%) after calibration became respectively 2700–2000 BC (39.7%) and 1900-1400 BC (28.5%), which could be synchronized with the Srubnaua and the Alakul'-Fedorovo antiquities of 1750-1530 BC (Fig. 163).

Thus, the entire set of chariots of the Ural-Kazakhstan steppes was dated by the authors within the ranges of: 3rd-2nd millennia BC – end of the 16th century BC. This will be our chronological benchmark in all subsequent findings and hypotheses.

On dating of the Chinese chariot complex. In Chinese historiography, a periodization system was developed on the base of chronicles written by court chronographers, which recorded fully and faithfully all meaningful acts of their owners. China's Herodotus, author of the «Historical Notes», Sima Qian originates from a hereditary family of chroniclers of the Zhou Dynasty.

We will need only the earliest dynasties:

Xia (2205-1767BC); Yin Dynasty, and then the Shang (1767 – 1112?BC) Western Zhou (1111 – 771BC); Eastern Zhou (770-256 BC) of two periods: Chun-Qiu [literally, Spring-Autumn] (770 – 476 BC) and Zhanguo [literally, Warring States] (475 – 221 BC), Qin Dynasty (221 – 206 BC) and Western Han Dynasty (206 – 25BC) [Ne-Hyun Yoon , 1985, p. 96; Chzhanshu Zhang, 1979, p. 279-284, In En, 1985, p. 141, China: History and Civilization, p. 14-48].

Further, I will list and group the calibrated dating of northern archaeological cultures relevant to the chariot complex, for their comparison with the dynastic dating [according to Epimahov, 2008, p. 95]:

1. Early Timber-Grave monuments:

Pre-Ural 2400-1950 (2650-1750) BC

Ural 1900-1750 (1980-1630) BC;

Middle Volga 2470 – 2190 (2600 – 2000) BC, - can only be synchronized with the Xia dynasty antiquities; chemakyns findings of this period are not known;

2. Elunino (Gorny Altai) 2200-1600 (2600-1300) BC, is a transcontinental phenomenon, like Seima Turbino 2120-1630 (2150-1600) BC, synchronized with the Xia Dynasty, the early period of the Yin and Shang dynasties, as well as Okunevo 2200-1750 (2600-1700) BC well-synchronized with the Abashevo, Sintashta, Petrovka and Potapovo antiquities;

3. Andronovo 1610-1410 (1740 – 1400) BC synchronized only with the antiquities of the Shang Dynasty; the developed period;

4. Karasuk 1440 – 1130 (1700 – 1050) BC well-developed and synchronized with the Late Zhou.

The following are two important conclusions:

- natives of the Group 2 archaeological cultures could be involved in the formation of the Chinese chariot complex, and its development during the middle and late periods of the Shang Dynasty could be influenced by the cultures natives of 3 and 4 groups;

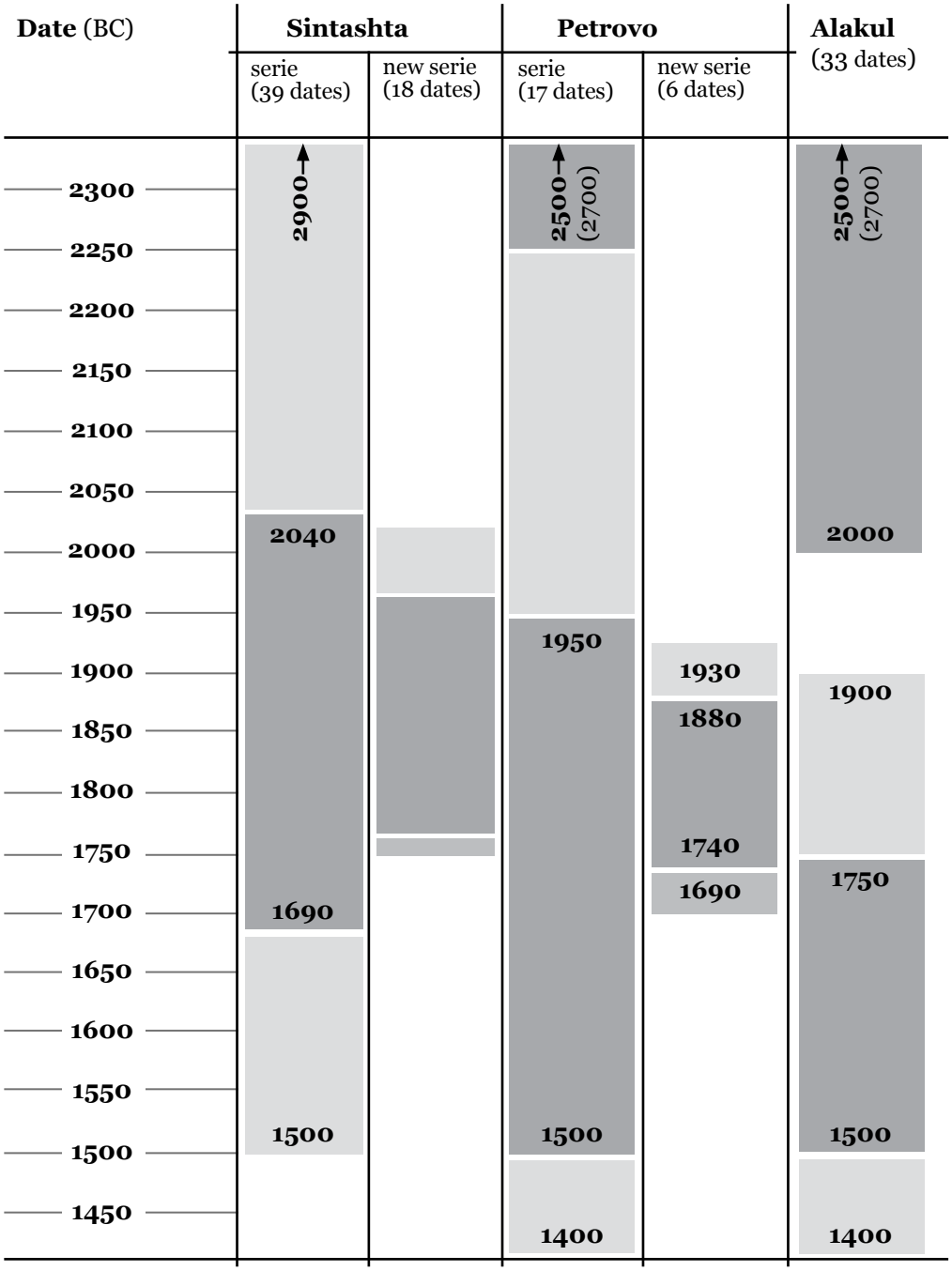


Fig. 163. Chronological scale. Radiokarbon chronology of the Ural-Kazakhstan chariot complex. Darker color calibration values with a probability of 95.4%, light – 68.2%. [Chechushkov, Epimakhov, 2010, fig. 7, p. 212].

- synchronization of these cultures and mapping of Group 2 monuments may indicate the direction and the stages in their natives' moving throughout space and time toward Ordos, via the only geographically convenient way: across steppe pastures along the Altai mountains and through the «Dzungarian Gate».

We will return to the conclusions, and now let's proceed with the comparison of dating for the Chinese chariot complex.

Throughout the Ordos area, occur finds of numerous daggers and knives of Seima Turbino and Karasuk type with bell-like or zoomorphic tops, flap-butt axes, spears, etc. These items have clear north, steppe features, suggesting an existence of a developed channel of communication and a flow of a large amount of weapons from the northern regions; a particular type of the contacts was expressed in attracting by Chinese rulers of individual steppe groups as allies or mercenaries.

These steppe groups could be known from inscriptions on the divinatory bones and bronze vessels tribes of guyfan, tuffan, gunfan, the Yan state, with whom Shang and Early Zhou rulers often waged wars. In this period, northern China «was a kind of a contact zone, where interpenetration and mixing of different cultural elements went on» [Komisarov, 1988, p. 55-56].

Lin Yun separates the so-called «northern complex» monuments of the Shang-Zhou period, localized in northern China and Inner Mongolia, from the synchronous monuments of the Central Plains [Lin Jun, 1986, p.237-273, Lin Yun, 1990, p. 29-45]. Analyzing the bronze ware of the «northern complex», he identifies the following types of objects: daggers and knives with tops shaped as heads and animal figurines, bronze axes with tubular sleeves and golden ornaments: temple rings and earrings with a bell. I'd like to note, that the selected types of objects are comparable to that of Seima Turbino, and decorations are typical to materials of the Andronovo community. Lin Yun notes that «the question on when bronze items of the northern complex first appeared in China, still awaits its further investigation,» [1990, p. 33], acknowledges an influence of the steppe tribes of Central Asia on formation of the «northern complex», with undeniable originality of cultures of the Central Plains.

It is hard to expect full similarity of things invented among shepherds and later presented in the cultures of Erlitou or Shang-Yin. These two worlds interacted by influencing each other, borrowing from each other at the level of ideas, principles, technologies, which then developed within one's own traditions. «The northern complex» identified by Lin Yun is a kind of contact zone in which such borrowing took place.

At the same time, the concept of «northern complex» does not explain the origin of the bronze casting technology of making things with a hollow sleeve, in forms. There are no data which would allow assuming the appearance of this tradition in the monuments of the «northern complex» or the Central Plain of China.

The earliest chemakyns are dated traditionally in the Chinese historiography to the Shang-Yin period. In the whole, the series dating of the Shan-Yin chemakyns is quite inhomogeneous [Cheng Tek'un, 1974, p. 209-229, 1960, 1957, p. 80-98; Kucera, 1977, p. 176-177, PI. 1, 6-10].

Materials from Xiaomintun and Dasykuntsun can be attributed to the middle period of the Shang dynasty, dated by the radiocarbon method to 1750-1400 BC. Calibration of these dates with the dendrochronological scale defined the upper limit of later than 1550-1520 BC [Klein, Lerman, Damon, Ralph, 1982], which is consistent

with the dating of the Shang-Yin chemakyns by other researchers [von Dewall, 1986, s. 168-186; Kozhin, 1990, p. 45-56, Lin Yun, 1990, p. 29-45].

A horn rod psalii allows to refine the dating of Zhou finds in the Western Zhou burial ground Bayfu, the wooden log-houses of which have the following calibrated radiocarbon dates: 1120 (+/-90) BC [Komissarov, 1988, p. 55] and 1085 (+/-130) BC [Chung-Suk Bae, 2000, p. 121]. The burial ground Bayfu has pronounced steppe features, by similarity with materials of the Lyulihe burial ground, it correlates to the ancient Yan state (one of the principalities of Western Zhou) in Northern China, which maintained, according to archaeological and written sources, active contacts with the Late Yin population of the Central Plains of China and the tribes of the steppe zone of Central Asia. Its radiocarbon dating does not coincide with the traditional early Chinese chronology, which recorded the migration of the Yan population from the Henan province to the territory of the Hebei provence, (present day Beijing, where the Bayfu burial ground was excavated) only during the rein of Cheng Wang, 1024-1005 BC. This fact may indicate permanent and earlier migrations of steppe population to the indicated territory.

The Shantsunlin burial ground is associated with the ancient state Guo, which was destroyed by another state Jin in 655 BC. From inscriptions on vessels from this burial ground, names of real officials of this state were reestablished, who lived during Xuan Wang, who reined in 827–782 BC. In the whole, this burial ground of different periods is dated back to 9th-first half of 7th cc. BC [Chung Suk-Bae, 2000, p. 132], which also contradicts to the radiocarbon dating (see below).

The Chzhantszyaopo burial ground relates to reign of Cheng Wang and Kang Wang (1004-967 BC) and is dated to end of 11th- first half of 10th cc. BC [Chung Suk-Bae, 2000, p. 123].

Dating issues of «the yoke models» were considered by Lin Yun. «The earliest are examples from a large tomb in Uguantsune (the Shang-Yin dynasty, the second phase of Dasykuntsun) and from the tomb of Fu Hao (Shantsunlin)» [Lin Yun, 1990, p. 38]. These graves are dated by the radiocarbon method to 1255 (+/-160) BC, but this date requires an adjustment on the dendrochronological scale, though in any event it relates to the Karasuk time.

Further, Lin Yun notes that «the yoke models» spread over the Central Plains of China and survive until 10-9 cc. BC. He aged their dating to the Shang period and suggests that «first work pieces ... were made in places adjacent to the Yin culture area, and as a result of their influence, bronze works of Yin style appeared, which quickly developed in the Yellow River basin. Relatively primitive forms of these products remained in the northern areas, reaching the Minusinsk Basin and more western areas quite late... «[Lin Yun, 1990, p. 39].

According to Lin Yun, based on written sources (bamboo annals), the Shang civilization began in 1523 BC, the Yin civilization in 1300 BC [Lin Yun, 1990, p. 30], and the transition from the Shang to the West Zhou occurred in 1027 BC [Komissarov, 1985, p. 87; Chung Suk-Bae, 2000, p. 111].

Questions of dating of the final stages of existence of the «northern complex» items in the territory of modern China, and especially of the Late Bronze daggers and the respective chemakyns and chariot gear, were considered in detail by Jung-Suk Bae [2000, p. 110-137]; he dates knives with zoomorphic tops and with a curved handle of the Chaodaogou type to 13-10 cc. BC; daggers with a curved handle and a bell-shaped top to second half of 12 – mid 9th cc. BC;

a straight handle daggers with and without grooves to end of 10 – 8 cc. BC (Nanshangen, Bayfu) and even later [Chung Suk-Bae, 2000, p. 133].

Relationship of the steppe tribes and early Chinese states are traditionally viewed as a confrontation of two worlds, the «barbarian» world of the steppes and the developed one of the Chinese civilization. Studies of recent years allow revising this traditional view and highlight some elements of the material and spiritual culture of pastoralists which were borrowed by the Chinese civilization and were developed within it according to their own traditions and ideas [Jakobson, 1988, p. 201-240]. Some of these adaptations are a chariot, skills of its management, some images and mythologems of the steppe pictorial tradition, bronze forms casting technology, horses and many mythological ideas, beliefs and cults.

So, dear reader, the pages you have read indicate that in early 2nd millennium BC in Eurasia began to form large chariot complexes, based solely on the old traditions, earlier discovered technologies and views.

The Middle Eastern tradition (precisely, Egyptian) of construction of vehicles has produced a new technical «miracle»: a light two-horse chariot, an effective weapon, which was immediately adopted by numerous armies of the Egyptian pharaohs, and with help of which they have provided the might and security to own country for centuries ahead, uninterrupted supply of own people and replenishment of resources and wealth from conquered and subject territories, in a word, have built the most perfect system for that distant time of internal and external communications of the country.

Not surprisingly, Ramses the Great built a whole new city for his charioteers and a factory for repairs, manufacture and maintenance of chariots, the study of which provides unique information about the technology of production and operation of the ancient Egyptian chariot complex [Herold, 2004, s.123-142] .

The pharaohs took due care of own greatness and divinity, creating a complicated system of worship and priestly rituals, ensuring their power and prosperity in this world and in the other, using the chariot.

Steppe societies, settled by this time all over the huge Eurasia steppes in the form of large patriarchal families – self-sufficient production teams of close relatives or groups of such, but simply put, pastoral clans – developed exclusively for the sake of their cattle. Many of them have succeeded in the invention of new instruments and devices that would facilitate their daily lives. Modernized and innovated were the closest and the most loved objects surrounding them every day. The horse, as the most reliable friend, began gradually losing its wild herd instincts, a new stage of domestication started; a clumsy home on wheels – a van – was modernized and changed its functions. All these became prerequisites leading to the invention of a chariot, a light, convenient for horses and humans and a more mobile gig.

Therefore it is not because of a combating or colonial-expansionist tradition, dictated by the Middle Eastern tyrants, but out of real needs of their hard nomadic life, that a chariot was born in the steppe.

The process of managing a chariot is a rather dangerous occupation that requires considerable skills in riding, agility and physical capacities. Chinese fortunetelling bones and chronicles describe numerous instances of falling from chariots, and constant damages to the latter. Undoubtedly, the best-suited and best-trained members of communities became charioteers who would occupy the appropriate social status and get due privileges. Probably, the first Chinese wangs were such charioteers.

As soon as this «miracle» of the steppe technology became available, which brought together all labor and productive resources of all relatives, without exception, the miracle only could belong to the most principal of all, to a leader or an elder of the clan. These physical developed, agile and fearless «owners» of the clans became the first charioteer.

And, of course, they quickly realized that they possess «wonderful» secret weapon which will permit killing, plundering and subjugating, in short, to develop a very successful and active external communication channels of their, initially very small, communities.

Such a model is likely to be at the heart of development in the steppe of the two centers of European and Asian chariot complexes at the beginning of the 2nd millennium BC on both sides of the Ural Mountains, which divide the continent into European and Asian parts. This natural boundary, possible, predetermined the vector of the subsequent move of the clans: one part to west, others part to east.

In the historical scale, it was a «lightning» process. Already in 19th-17th cc. BC, these clans, moving on already well-known routes, to be exact, on pastures and ecological niches, have been mastered by their ancestors, have reached the contact zones with agricultural civilizations. These were: the Mycenaean and Achaean Greece and primitive tribes of Europe in the west, the early Chinese dynasties in the east, Harappa, Assyria, Babylon, and by the middle of the millennium, Egypt to south. Further, in the following sections, we'll once again turn to these issues.

Now let us return to the main topic of the section on chronology and priority. I suppose the answer is obvious. There is no Middle East priority in invention of chariots; there are Egyptian Pharaohs, Babylonian and Assyrian despotic tyrants and their ambitions. The steppe chariot complex, in the European and Asian understanding, has chronological precedence over that of the Middle East, or more precisely, the Egyptian, where its appearance could be very swift, immediately after the «miraculous» acquaintance with it. The Egyptian pharaohs and eastern despots had enough resources to embody instantly any technical innovation and ideas seen around.

This story is also important because thanks to the refined dating of the Asian, and the Ural-Kazakhstan chariot complex in particular, there is an opportunity to refresh our look at our chariot petroglyphs. ■

Pictorial sources

Tomb slabs

These chariot images, because of their certain chronological position recorded in a burial rite, act as a unique dating «reference» in clarifying a position in time of the entire array of rock images of vehicles. There might be two options in use of tomb slabs with images: as a occasional construction material, long after the vehicle images were pecked on the slabs; or an image was especially made on a slab as an integral element of a man's burial whose life somehow related to wheeled transport.

When dating is complicated, both options do not exclude a use of already existing engravings. Anthropological materials from such graves, implements, wide geographical range of sources of this kind from Scandinavia and Greece to Yenisei suggest that the buried were charioteers. A series of vehicle images was found on slabs of Karasuk burial grounds (Fig. 88:3-5) associated with the heyday of the Asian chariot complex.

The burial ground of Varcha Severny Bereg I, (Fig. 85) was excavated by G.A. Maksimenkov. There are engraved schematic images of a vehicle (6.6.V.1.), unclear lines and eight animal shapes, apparently, of horses, performed in the «linear-geometric» style on the south wall of the burial box of mound N 11, on a plane facing the ground. Horses on the slab are grouped in pairs. One couple is at a vehicle, the other three are made up of opposite sex. Horses of the central pair are facing each other with a tree in between them. It is a subject «Horses at the World Tree», well known in Asian petroglyphs. This finding by itself is an exclusive for subsequent «decoding» of the chariot «message».

Initially the slab was larger in size, as evidenced by a broken figure of a horse and vehicle wheels. The box was of a trapezoidal shape; the buried was a man of mature age, in anatomical order, lying on his back with head turned to east; nearby, a crushed vessel of Karasuk appearance [Leont'ev, 1980, p. 69-73, Fig. 2].

The burial ground Chernovaya VIII (Fig. 85A). Images of two «A»-shaped vehicles (one partially preserved) and images of bulls were re-opened as a result of the processing in the Hermitage (see previous chapter).

The burial ground Hara Haya, (Fig. 85). There are engravings of human and animal figures and five vehicles on broken overlapping slabs and the north-eastern wall of one of the tombs. A well-preserved slab with images was published; it was one of five slabs making up the trapezoidal box, installed in a large rectangular enclosure with annexes. The engraved slab turned inside the grave. Its images are: a gig without harnessed animals (6.6.HHI.), an ibex, unidentified animals, different shapes; a vehicle image is cover by two lines: one forms a closed space, the other connects two horse shapes.

The tomb was robbed; the finds are two bronzes decorative rings, cattle bones and a separated skeleton of a man of 30-40 years old with numerous injuries on the skull, one of which was fatal. According to the author, it is a charioteer's grave [Filippova, 1990, p. 166-168, fig. 1].

A vehicle image is engraved on a slab from the Uibat valley, brought in 1912 to the Minusinsk museum. Finding circumstances are unknown.

Arzhan 2 mound. One of the fence slabs bears a chariot image [see Appendix 3].

Fig. 164. 1 – Arzhan 2. Plate 10/02 from the south-eastern sector of the fence. Photo and drawing by [Chugunov, 2011, p. 53-65]. 2 – Darwi somyn. Chuluutyn ogtoh. Kobdos aimag. Deer stone with a chariot [Volkov, 2002, p. 218, tabl.103].

In addition, slabs with animal images without vehicles were found in a Karasuk tomb in the Poltakov ulus, in a Late Karasuk mound at the Tunchukh Mountain and in a destroyed Early Tagar grave at the village Bystraya. [Leont'ev, 1980, p. 72, 74].

In south part of the steppe zone of Kazakhstan, during excavations of the Fedorovo-Alakul" burial ground Tamgaly, located at the entrance to the gorge with petroglyphs of the same name, one of the grave slabs was found with an image of an ibex [Maksimova, 1958, p. 108-110]. Subsequent excavations of the Andronovo burial grounds in this valley revealed two «profile» human figures facing each other with raised hands united on a stone wall of other grave [Rogozhinskiy, 1992].

A.A. Tkachev found a horse picture on a slab of the Fedorovo burial ground Samara in the central part of the steppe zone of Kazakhstan. A fence slab, dug in on its edge, is turned with its image plane to a central tomb. a horse figure is made by the dotted pecking techniques, followed by polishing. An emphasized horse mane is drawn by rare oblique notches. The figure is similar to an image of chariot horse found in the

Koksu river valley. The slab with the image is now exposed in the Karaganda Historical Museum [Tkachev, 2002].

Deer stones

A megalithic tradition of installing a commemorative stele has a long history in almost all parts of the continent, and is characteristic to an earlier period in the southern Russian steppes (Kernosovsky Idol, etc).

Together with the «first wave of migrants,» the tradition «arrived» in vans to the eastern part of the Eurasian continent, and manifested itself in mass Afanasievo and Okunevo stelae in the Minusinsk Basin, known here at the turn of 3rd and 2nd millennium BC [Semenov, 2011; Lazaretov, 2011, Esin, 2011].

From the mid-2nd millennium, this tradition revives in the form of a memorial stelae, a deer stone of the Karasuk time (Fig. 164). I believe that a new outburst of this tradition is associated with the development of the Asian chariot complex and an increased social role of ancestors (aruahs), among them glorious charioteer, who once established these clans.

Most part of the known deer stones is covered with ornaments and weapons of Karasuk appearance. [Volkov, 2002; Savinov, 1994]. More than that, a deer stone in Darvi sumyn (alpine valley of Chuluut, Mongolia) contains on the same surface a stylized chariot and the Karasuk dagger [Volkov, 2002, p. 93, Fig. 6, PI. 103-2; Novgorodova, 1989].

Attempts were made to compare the images on the deer stones with their analogues from graves [Jam, 1995]. Dating of these objects indicates a period from 14th -beginning of 10th cc. BC.

A.A. Kovalev [1986, 2000, c. 138-180, 2001, p. 160-162] identifies a group of deer stones, which are part of some ritual «sanctuaries» not connected to funerary structures (in the traditional sense), and allocates them to a separate archaeological culture.

Strongly objecting the allocation of such culture, I believe that this group of deer stones is associated with the worship of a charioteer-ancestor. It is justified by the presence on these stones of a chariot equipment – the two-looped buckles (so-called «models of the yoke») for managing a vehicle, a kind of «hands free» for a charioteer, – and of various weapons for distant battles (bows and arrows) and the melee (axes, battle-axes, chisels, akinak-daggers), which describes the complete set of warriors-charioteers.

It is noteworthy that all of the above items were attached variedly to a charioteer's belt and many times repeated on deer stones in various combinations. From a practical point of view, as noted above, attaching charioteer reins to own belt considerably expanded the charioteer's military capacity and allow to do without a driver.

The complex of combat equipment [Khudyakov, 2002, p. 139-141] is what brought the fame to their ancestors; it includes almost all known at the time options: a complex bow and arrows, spears, including those with a hook, chisel, a kelt, an ax, multi-toothed tip, a sword, a dagger, as well as a means of protection, a shield, shown on Karasuk deer stones, – and clearly demonstrates knowledge of chariot weaponry, but also skills of correct and comfortable arrangement on special hooks on belts of these venerable ancestors-charioteers.

A.A. Kovalev, exploring the distribution of early types of deer stones in the Eurasian continent, came to a conclusion that the tradition was formed in Mongolia, in the basin of rivers Bulgan-goal and Tsingilhe [2000, p. 165] and highlights two initial pictorial traditions: the «Mongol-Transbaikal» and

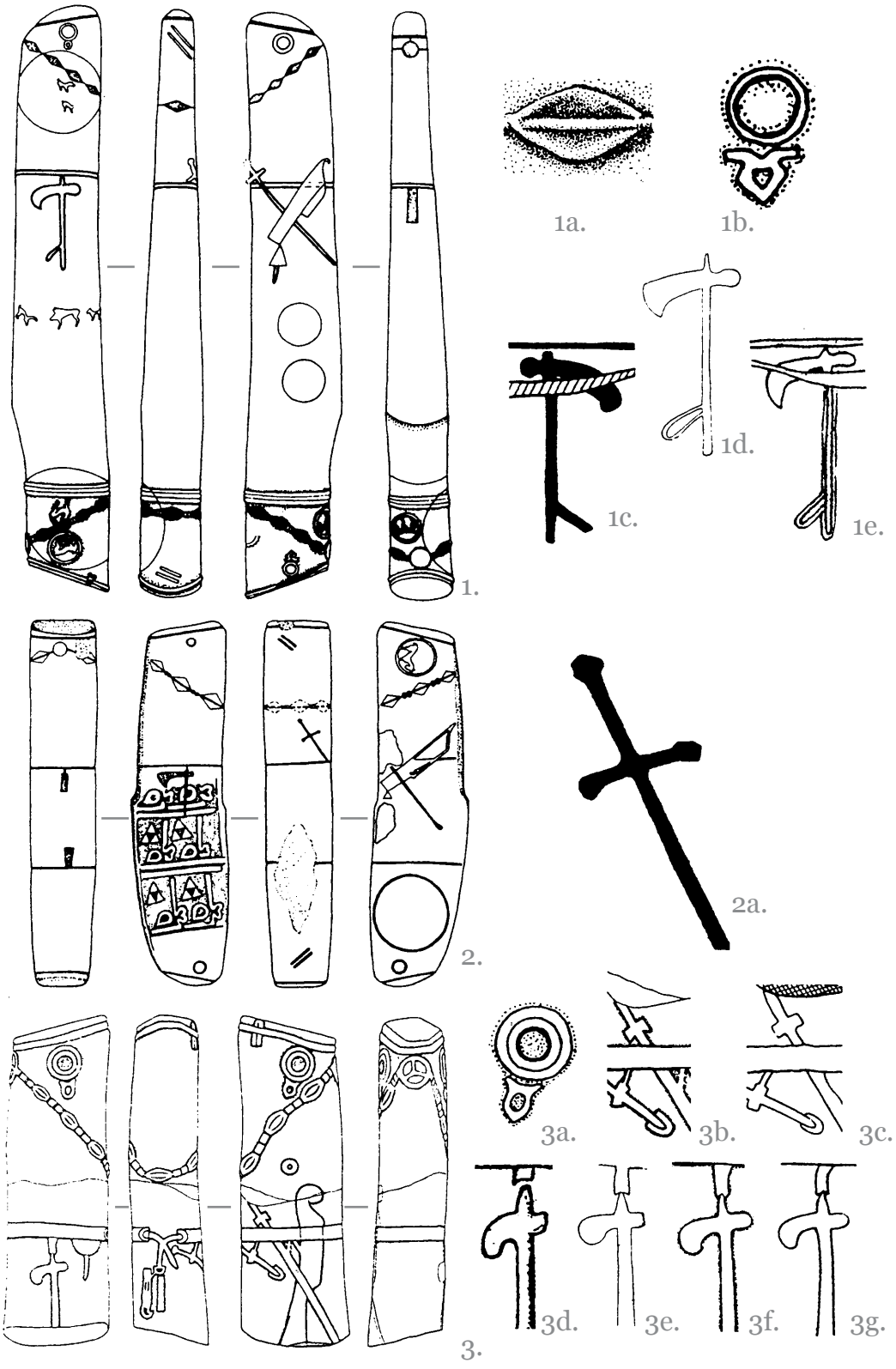


Fig. 164A. Deer stones of western Eurasia.[Kovalev, 2000, p.139, fig. 1]. 1 – Zubovskaya stelae: 1a – bead; 1b – ring; 1c – an axe; 1d, e – axe; 2 – Ust-Labinsk stele: 2a – the image of a dagger; 3 – Kyzburunsk stelae: 3a – ring, 3b, c – sword; 3d, e, f, g – axes.

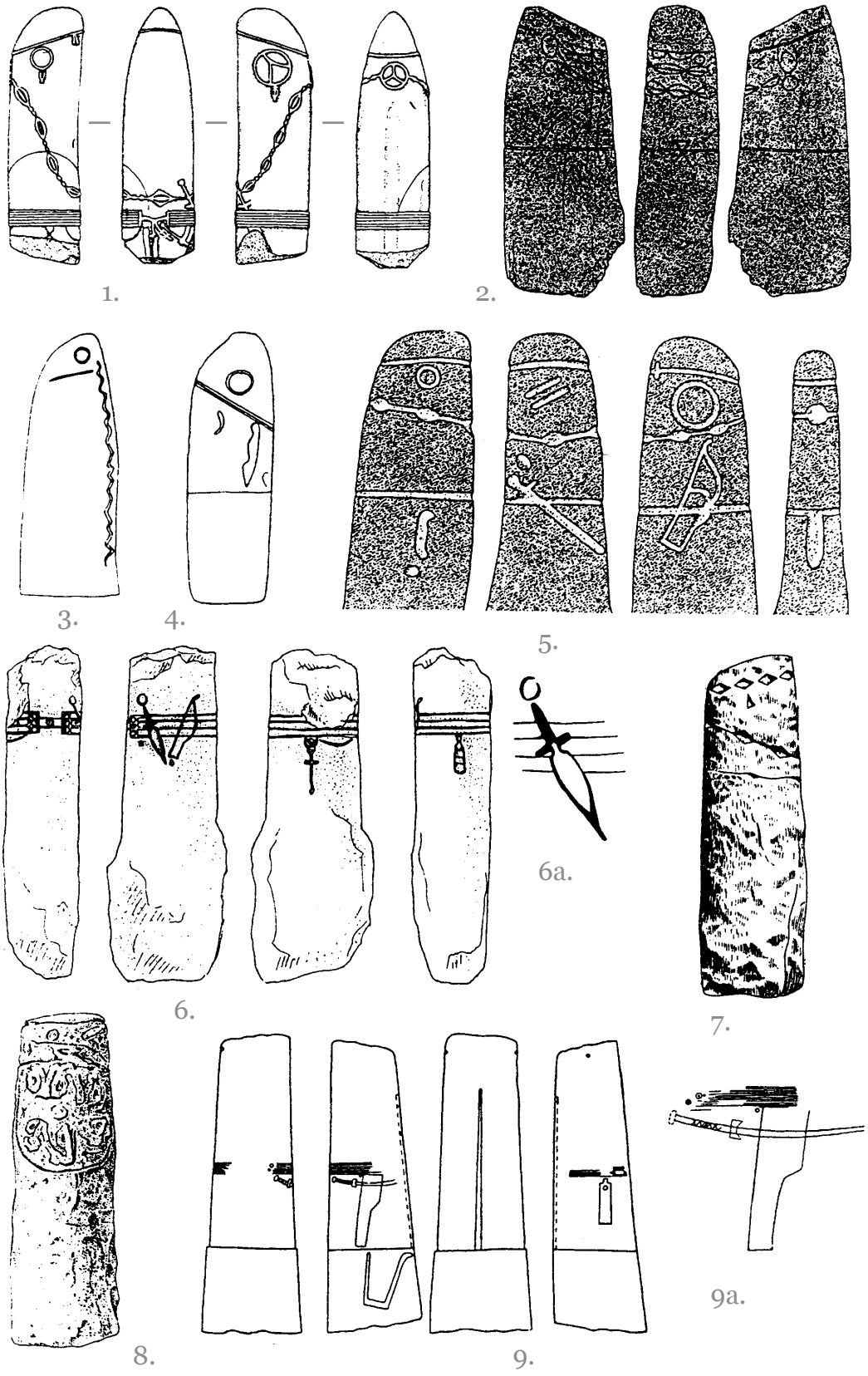


Fig. 164B. Deer stones of western Eurasia.[Kovalev, 2000, p. 140, fig. 2]. 1 – Armavir stelae (Lake Maryinsky); 2 – Dinogetiya – Garvan (Romania); 3 – Sanomer (Georgia); 4 – Zeehauzen (Germany); 5 – Gumarov (Orenburg region); 6, 6a – Tselinnoie (Crimea); 7 – Kichkasskaya Ferry, barrow 25, tomb 6 (Ukraine); 8 – Konstantinovka (Nikolaev region, Ukraine); 9, 9a – Olvia.

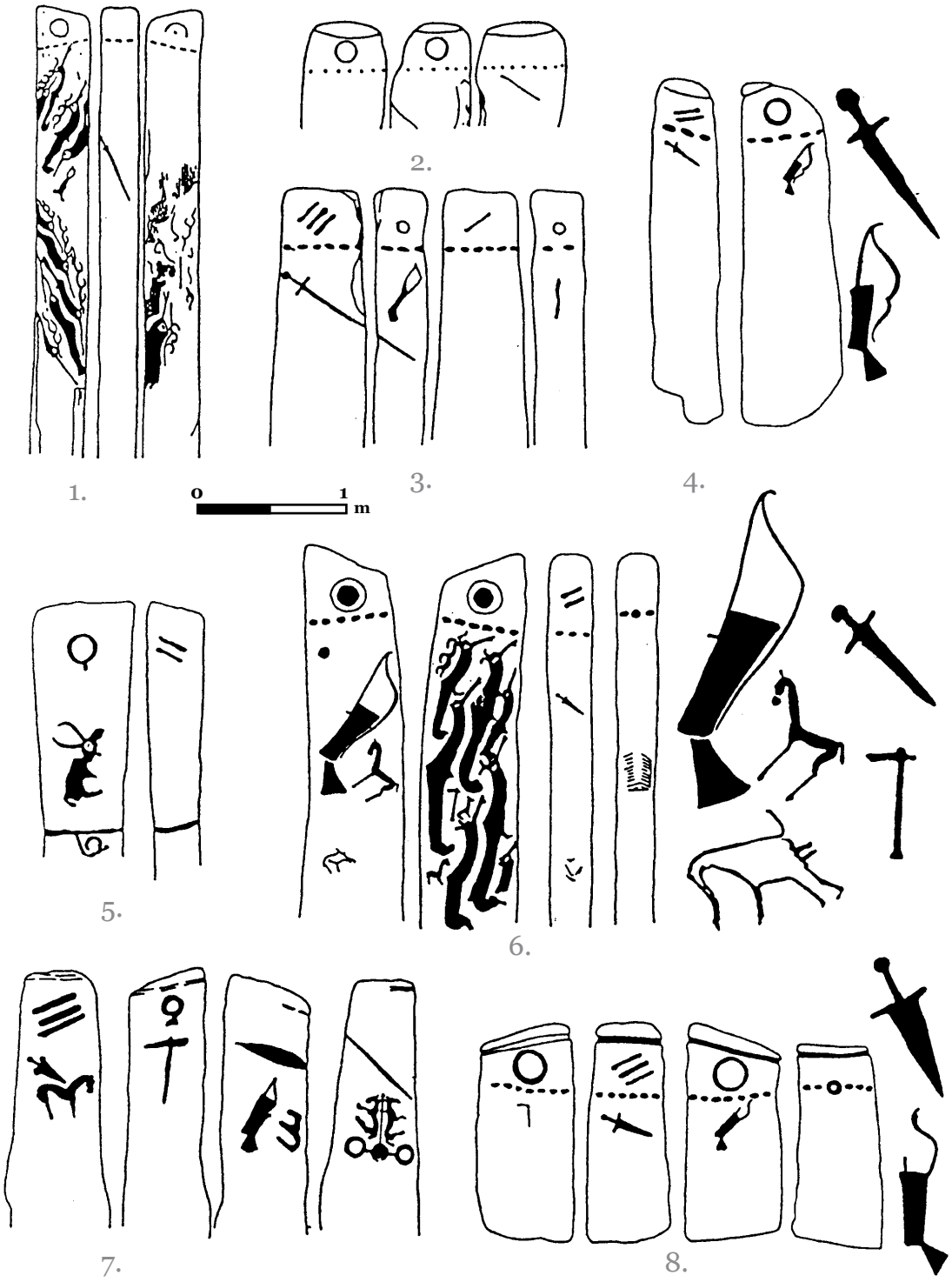


Fig. 164C. Mongolia. Deer stones from the basin of Bulan goal and Tsingilhe rivers. 1 – Kenmonake; 2 – Tuerhun, Tsyuerbali; 4 – Har gov 1; 5 – Telengetyn am; 6 – Har gov 2; 7, 8 – Chuluutyn ogtoh. [Kovalev, 2000, p. 164, fig. 12].

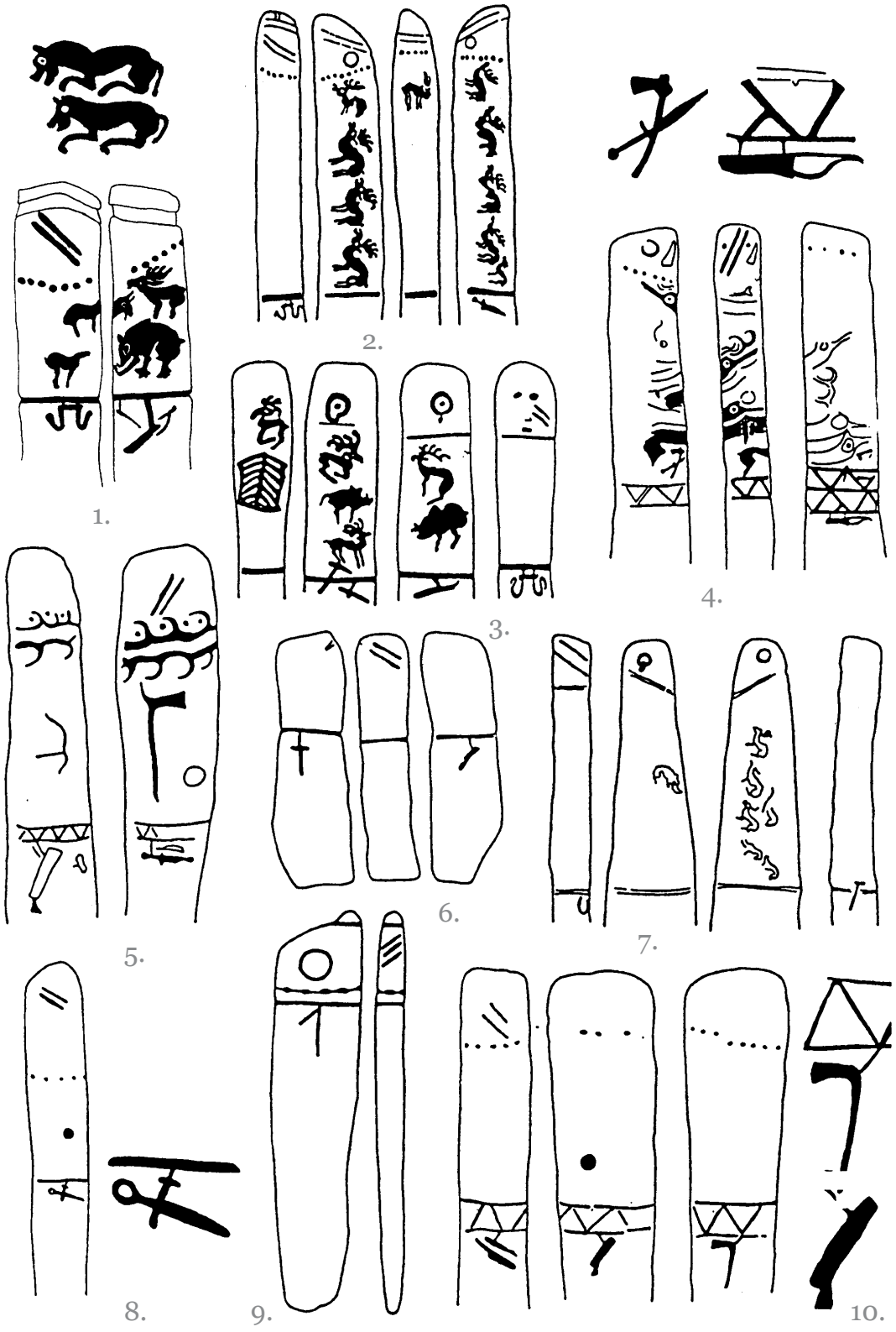


Fig. 164D. Deer Stones of Mongolia and Tuva. 1 – Urad Hurain am; 2 – Durulzhin am 2; 3 – Durulzhin am 1; 4 – Argyn Brigade 4; 5 – Argyn Brigade 2; 6 – Argyn Brigade 7; 7 – Hushotynam; 8 – Argyn Brigade 8; 9 – Boosh Tug; 10 – Agar settlement 1, Tsagaan Uul sumyn. [Kovalev, 2000, p. 166, Figure 13, Volkov, 2002, p. 202, Table. 87].

the «Sayan-Altai,» which co-exist with the «Arzhans-Maemir» style in Central Asia which was forming the early stage of the Scythian-Saka animal style as early as in 9th cc. BC [2000, p. 165-173], and the author sees the earlier origins of this tradition in the monuments of 12th-10th cc. BC in North China [2001, 165]. Spread of the tradition of setting deer stones to west of the continent up to the Black Sea is a fact for many researchers [Savinov, 1994; Chlenova, 1996].

European chariots complex

Images of vehicles on tomb slabs were found in other regions of Eurasia. In Northern Europe, famous are slabs from the grave in Kivike, the Swedish province of Skåne (Fig. 165), with engraved images of a two-horse chariot with a charioteer, accompanied with circles and inscribed crosses [Malmer, 1981, fig. 6, 16.], as well as slabs from Vilfara [Althin, 1945, taf. 81].

In Greece, the profile image of a chariot with a charioteer (Fig. 167-168) on slabs of the V shaft tomb at Mycenae [Gernes, 1914] is combined with a spiral ornament matching the wall decor of vans' body from the Lchashen burial ground. In the Crimea, a slab fragment from a destroyed grave in a Simferopol mound preserved an image of spoked wheels with a part of the axis of a vehicle [Cherednichenko, 1976, p. 140, fig. 4.3, 7-3].

In the Caspian, on the territory of Dagestan, in the Berekei burial ground, an image of a chariot and two separate spoked wheels were found on a stone box slab. In the tomb discovered were: an arrowhead, flint inserts and ceramic vessels dating from the end of 2nd – beginning of 1st millennium BC [Kruglov, 1940, p. 65-69, Figure 12; Littauer, 1977, p. 252, fig. 27].

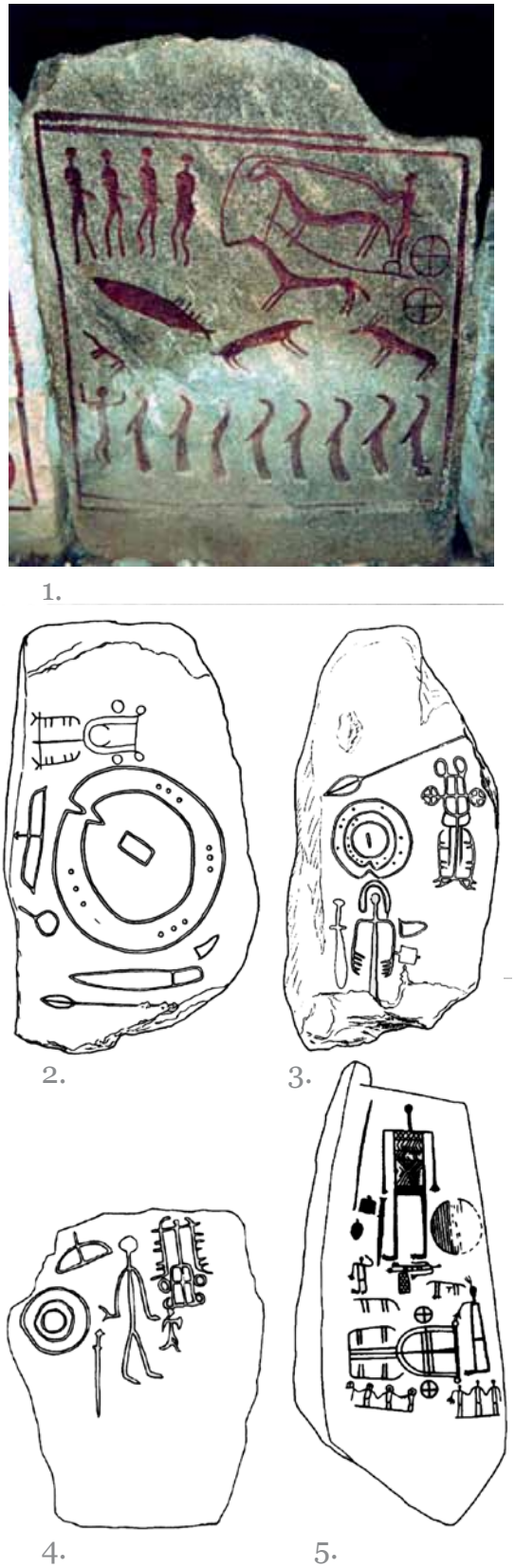


Fig. 165. Europe's slabs and stelaes with images of carts: 1 – Kivik, plate from the grave [Larsson, 2004, s. 392, abb. 14]; 2 – Torreyon Del Rubio (Casares), 3 – Cabeza de Baillet I (Badajoz); 4 – Cuatro Casas dei Carmona (Sevilla); 5 – Ategua (Cordoba) [Pare, 2004, s.367, abb. 11].

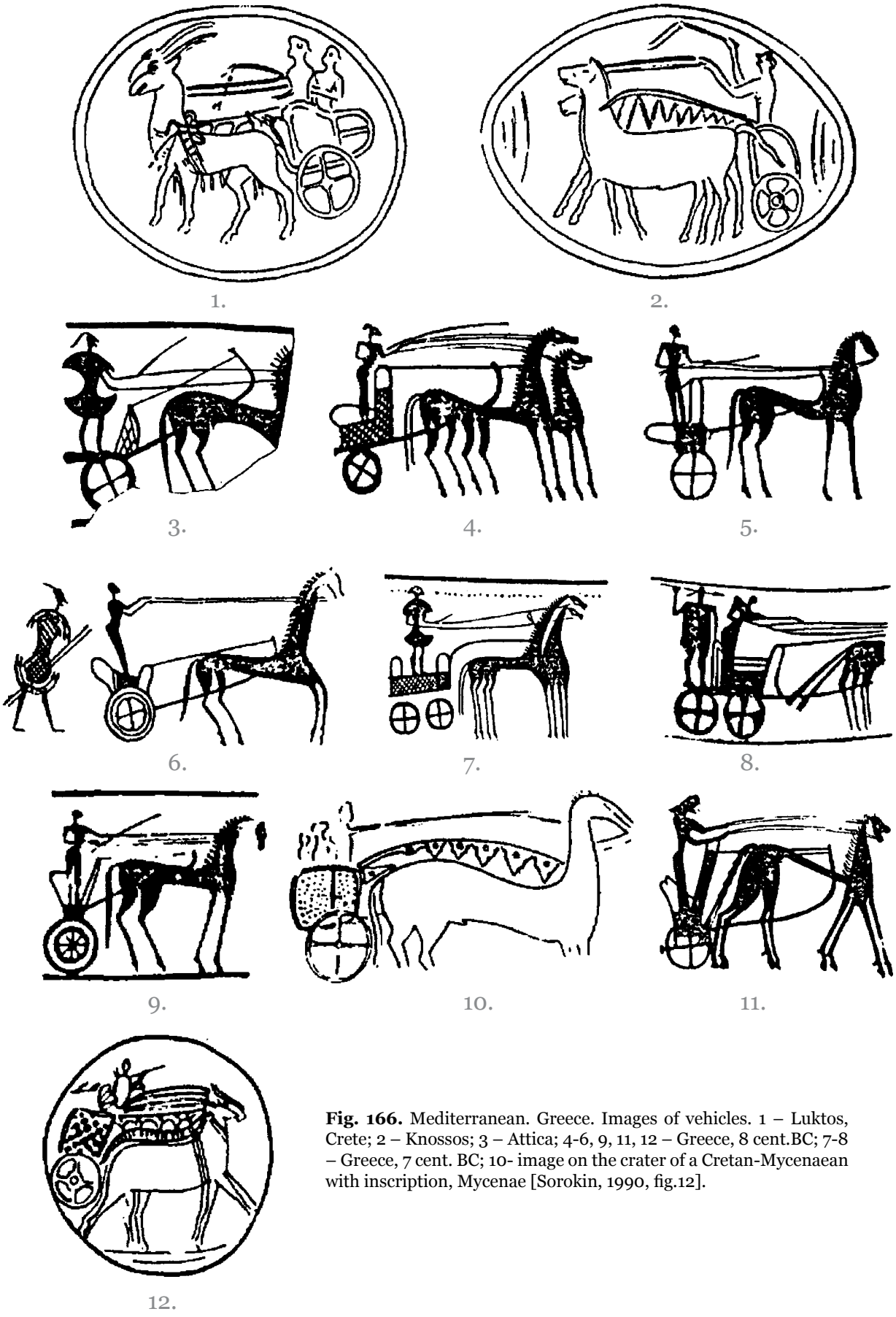


Fig. 166. Mediterranean. Greece. Images of vehicles. 1 – Luktos, Crete; 2 – Knossos; 3 – Attica; 4-6, 9, 11, 12 – Greece, 8 cent.BC; 7-8 – Greece, 7 cent. BC; 10- image on the crater of a Cretan-Mycenaean with inscription, Mycenae [Sorokin, 1990, fig.12].

Stelae with images of vehicles are known in Spain (Fig. 166), in the monuments of Cabeza de Bayeux, Toreyon Del Rubio, dated by the style and analogies to military objects from archaeological excavations of 8-7 cc. BC [Piggott, 1983, p. 131, fig.79].

Images on vessels

Among important sources of the study of Bronze Age chariots should also include their pictures on ceramic vessels (Spassky, Dry Saratovka I, Dry Mechetka II, Politotdelskoe and others [see Zakharov, 2000, c. 64-65, Fig. 39] associated with the Alakul' (Andronovo) and the Timber-Grave cultural-historical area (Fig. 168).

In the Lower Dnieper, the Timber-Grave burial mound near the Lvovo village of Kherson region a vessel was excavated under the rim of which a chariot was depicted using cord prints.

The funds Zhdanovsky regional museum, near the Azov Sea, contain a jar vessel of the Timber-Grave appearance, discovered by accident. The vessel sides have images of four circles with inscribed crosses, made by pressing molded rolls. By pressing a hollow tube two horseshoe marks were made. Perhaps, two pictures of chariots without draught animals were shown here [Cherednichenko 1976. 139-140, fig. 5-6].

A similar composition is shown on a jar vessel from the Timber-Grave burial ground at village Politotdelskoe in the Lower Volga [Cherednichenko, 1976, Fig. 4-1].

A chariot, made with carved lines, similar to images on rocks, was found on a pot from the Timber-Grave burial ground Dry Saratovka, in the Saratov Volga area [Galkin, 1977, s.189-193], as well as on a vessel from the Alakul'-Timber-Grave mound near the Spassky village in South Urals [Stokolos, 1972, p. 47, Fig. 13.12].

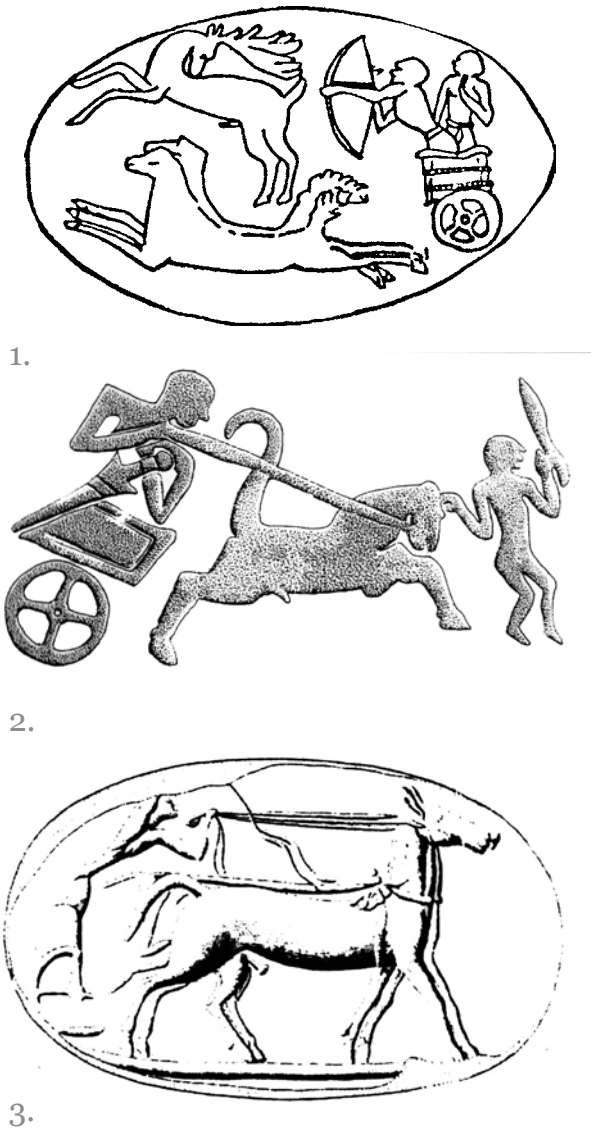


Fig. 167. Mediterranean. Images of vehicles. 1 – gold ring, Mycenae; 2 – detail of stone relief, Mycenae; 3 – Sklavokambos, Crete. [Cherednichenko, 1976, fig. 5; Crouwel, 2004, s. 341-342, abb. 2,4].

A spoked wheel is shown on a vessel fragment from a Late Bronze camp of Tau-Tube 3 in the North Caspian region [Vasiliev, stakes, Kuznetsov, 1986, p. 108-148]. Circles with inscribed crosses on bottoms of Andronovo vessels can be considered as an important element of the solar symbolism, [Zdanowicz, 1988, p. 64, fig.26-4].

European finds of vehicle images on vessels and funerary urns were presented in a special study by J. Cordier, where he compares them with the rock pictorial tradition.

Out of 45 considered objects, 11 are vehicle images on ceramics, the rest are petroglyphs of Central Europe, France, Spain and Sweden. In this series of pictures, there are even portions of two- and four-wheeled vehicles (23 and 22) [Cordier, 1975, p. 451-482].

In Slovakia, four chariots drawn by two horses (two on each side of the vessel) are shown on a clay pot from grave with cremated remains of the Pilinsky culture at the Great Rashkovitsy village. Figures of charioteers behind the chariots can be distinguished [Vizdal, 1972, s. 226, taf. 1].

A zoomorphic porphyrite vessel from Sarazm (stored in the Hermitage) contains an image of a human face. Eyes are deep set in circular depressions, triangular, prominent nose and cheekbones are emphasized. Similar stone sculptures of people were discovered by G.B. Zdanovich in the area between Ural and Irtysh. Being random finds, they are connected to the Sintashta-Petrovo monuments and date back to the first quarter of the second millennium BC. They are very close to the Shang-Yin figurines and masks, which became a prototype of numerous military helmets, described by A.V. Varenov [Appendix 3, Fig. 40].

In the Hittite capital, Hatusse (Boğazköy), on a fragment of a stone vessel a wheel image was found [Littauer, Crouwel, 1979, fig. 27].

In India, Deccan, there is an image of two-wheeled «A»-shaped vehicle drawn by a pair of oxen, in the ceramics of group II of the monument Inamgaon. [Schetenko, 1979, p. 160, fig. 39].

Images of chariots on seals and fine plastics

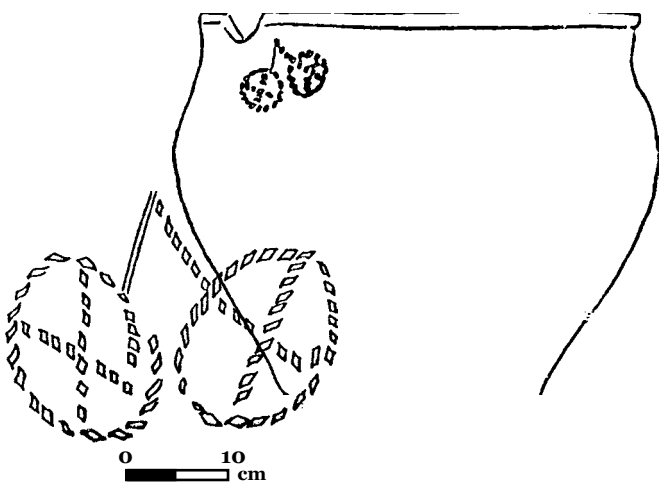
Images of two gigs on a bone plate was found in China, the 102nd tomb of the complex Nanshangen [von Dewall, 1986, s. 168-186; Komisarov, 1988, p. 89-92, fig. 74]. Its style coincides with the manner of interpretation of the images in the Central Asian rock art.

Images of a chariot on a golden ring from the tomb IV at Mycenae [Muller-Karpe, 1980, tafel. 225-16, 25] and on the cylinder seals [Littauer, Crouwel 1979, fig. 13, 17, 21, 24-29, 33-35, 39-41, 81] already become classic.

Of particular interest is a series of compositions with chariots on the cylinder seals, occurring mainly from the territory of northern Syria, Anatolia, Ugarit (Fig. 170-173), as these very images of chariots served as an argument for the Middle East concept of their origin [Littauer, Crouwel, 1979, p. 68-72].

Most of the considered cylinder seals is now stored in the collections of the Oriental Department of Louvre, as well as a dish from Ras Shamra with a splendid scene of hunting in a chariot (Fig. 169), [Amiet, 1961, 1966, see bibliography].

Dating of many of the seals is not yet completely defined, some of them – NN 4, 6, 10, 23, 29, etc. – come from the layers of monuments dating from 18-17 cc. BC [Littauer, Crouwel, 1979, p. 69]. The upper chronological limit for the Ugaritic seals is determined at the time of destruction of this city by marine peoples in 12th cc. BC. [Caubet, 1990, p. 81-85]. In the middle of 2nd millennium BC, the city maintained particularly active trade relations with the Hittites and Mycenae. A date of chariot images on the Syrian seals is determined by analogy with two exemplars of the Nuzi archives, dating from the second half of the 15th cc. BC. A horse-breeding treatise with the Aryan vocabulary of Nuzi dates from the same time [Kuzmina, 1994, p. 163-194].



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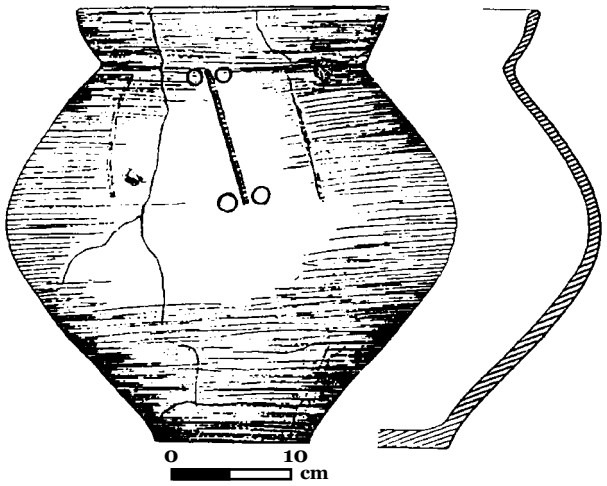

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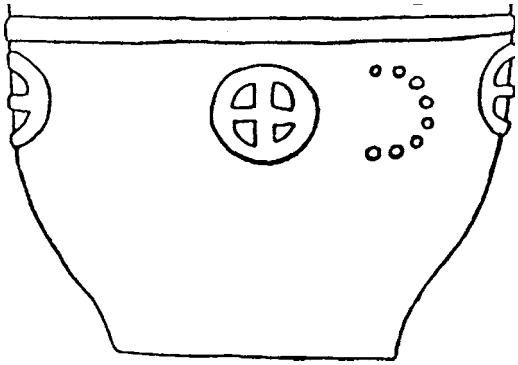

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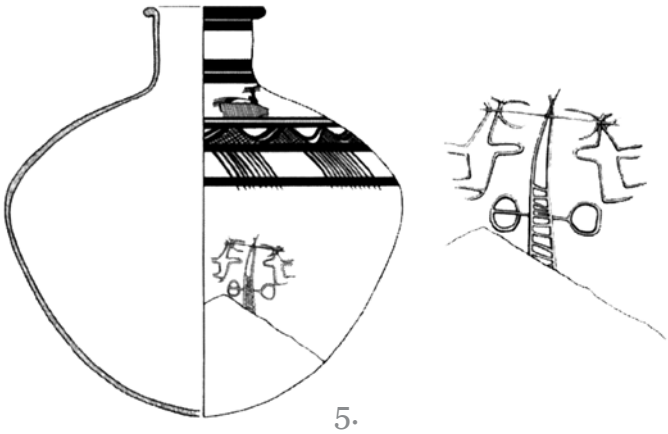

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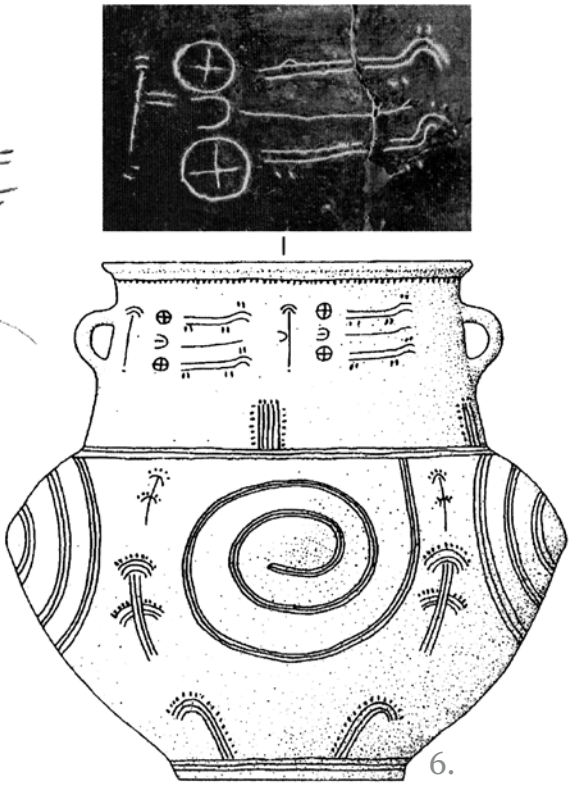

6.

Fig. 168. Vessels with images of chariots. 1 – a vessel from a burial near Livovo, Lower Dnieper; 2 – Ostrowiec Svetokrzhitsky, Southern Poland; 3 – vessel from Zhdanov Museum, Azov region; 4 – vessel from Dry Saratovka, the Volga region; 5 – a vessel from the settlement Inamgaon (India); 6 – vessel of the Veliky Rashkovtsy (Slovakiya). [Cherednichenko, 1976, fig. 5, 6, 10; Bakker, 2004, s. 288, abb. 7; Kenoyer, 2004, s.103, abb.17; Boroffka, 2004, s. 351, abb. 12].

Fig. 169. Ugarit (Ras Shamra). Gold dish with a hunting scene in a chariot. Louvre AB 17 208. Foto Musee du Louvre.

All chariots are depicted in profile projection, in three cases (NN 23, 51, 52); there are attempts to portray a chariot and charioteers in plan. Chariots are combined with various images, most traditional of them is «a defeated enemy,» a well-known, for example, by the composition of the Ur Standard. Frequent are images of cancer and a fish. Sometimes a scene is framed by an image of «the world tree» (NN 15, 34, 40, 47, 55), in one case, these images are replaced by figures of horse-deers with branching antlers (N 48). Images of chariots are combined with figures of dogs (N 5, 11, 27, 29, 33, 35, 36, 48, 52, 53) making 17.9% of all compositions, and with figures of mountain goats (N 10, 29, 30, 35, 46, 47, 48, 51, 52) of the same proportion, 17.9%.

Distinguished are figures of ibexes, with legs bent close to the body in a pose of «the flying gallop» (NN 2, 10, 29, 46, 47), are strikingly similar in the performance manner to those of petroglyphs of Mongolia and Kazakhstan of the Pre-Saka period. There is a special character in these compositions, a man with a «tail», a possible prototype of the Greek Satyr or the god of shepherds Pan (NN 22 – 24, 27, 31 – 32, 39), who also has many analogies in petroglyphs of Altai, Kazakhstan, Mongolia and South Siberia [Kubarev, 1987; Johns, 1990, fig. 1-3, 13, 23, 26, 28, 69,71-72, p. 16-96].

Noteworthy, that the discussed above sun-headed anthropomorphic creatures, whose origin is connected with a bird image, are provided with «tails» too (burial grounds Tas Haza and Cernovaya VIII, grave 21). In the considered series of stamps, a bird with a chariot is depicted in most cases. In general, the mythologem «vehicle of the solar god – a bird» (a swan), is typical to Indo-European (Indo-Iranian) myths [Ivanov, 1969, p. 54].

Use of chariots in warfare, i.e., against «enemies», is noted in 9 cases, in hunting scenes in 9 cases, and in religious ceremonies in 4 cases. Attention is drawn to «L-shaped» object in charioteers hands. This is goads, findings of which are known in mounds with vehicles from the Trans-Caucasia (Trialeti, Lchashen) and the steppe zone (the Tyagunov grave, Aschisu, etc.).

Juxtaposition of these observations with the results of the analysis of subjects with vehicles in petroglyphs of the Middle and Central Asia reveals a structural similarity in «the pictorial series» of compositions, namely, combination of vehicle images with images of ibex, deer and dogs. It could only be explained by the coincidence of mythological knowledge on vehicle and mythological concepts associated with it.

Content of the chariot myths in Anatolia, Syria, Central Asia could be similar, if not common. Differences occur in expression of these ideas, primarily, in use of the profile projection and of typical ancient Shumerian subjects. Traditional ideas are translated into other characters: the prostrated «enemy», a cancer, a leo, fantastic griffins, sphinxes, in other religious ceremonies. There are some individual iconographic matches, for example, observed in images of mountain goats with legs bent close to the body, or in a manner to place their bodies in a binary opposition.

Among the geometric style paintings of the Argiv plain (mainland Greece) and on craters of later layers of Ugarit, a subject «an owner of horses» performed in the Late Mycenae style is spread: an isolated man holding by the bridle one or two horses. Usual is an image of fish, and very rare, of waterfowl [Langdon, 1989, p. 185-201]. There is also an ibex figure on the Ugaritic crater. Iconography of these paintings reminds the subjects met on the cylinder seals.

S. Langdon suggested their identity on the principle of pars pro toto and connected to a male deity Poseidon-Gippios. In the classical Greek tradition, his attributes

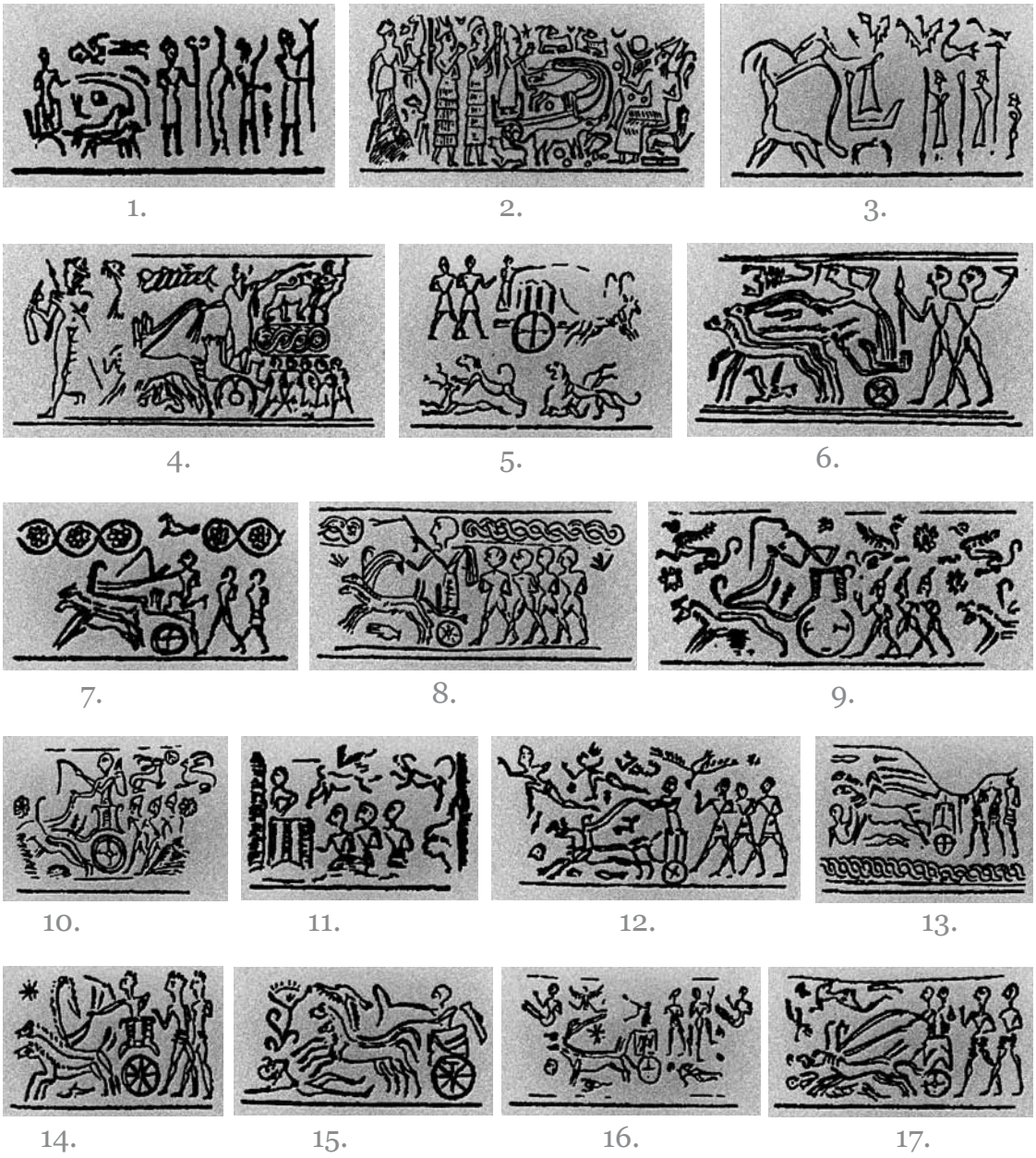

Fig. 170. Near East. Prints of cylinder seals. Paris, the Louvre and other museums. The investigated cylindrical press published or stored in the following collections: 1, 5, 19, 27, 29 – [Amiet, 1969, p. 1-8, fig. 1-3, 5, 8-9], the index is in the Louvre AO 8306, 2 – [Ozguc, 1965, N 24, 3, 4, 8, 10, 13, 16, 18, 30 – [Buchanan, 1971, pl. 1-c ,2-c ,11-d, 14, 1960, p. 32], are in the British Museum (BM 16815), the Museum of Ashmolian (AM NN 892-895), in the Babylonian Collection Neville (NBC, N 8931), in the Yale Babylonian Collection (YBC, 12,799), 6, 33, 34, 36 – [Porada, 1947, N 527, 910, 971], in the collection P.Morgan, 7, 15, 17 – [Osten, 1934] in the collection of Neville, N 341, 343, 687, 9 – the Louvre, in the collection of de Clair, N 287, 11, 37 – [Woolley, 1955, pl. LXVI-136; LXII-44]; 12 – [Smith, 1939-1940, pl.IXa]; 14, 28 – from a private collection (Document Seyrig); 20, 23, 24, 41 – [Delaporte, 1910, 1920, A .955], the National Library N 479-480, in the collection of Schlumberger N 51, 21 – [Speleers, 1917, p.208, N 489]; 25-26 – [Parrot, 1951, p. 183, pl. XII-1, fig. 2] 31 – [Katling, Karageorgis, 1960, p. 122-124, pl. 30], 32 – the image on the scarab of Thutmose I; 35 – [Moortgat-Correns, 1955, tf. III]; 38 – [Zwierlein-Diehl, 1969, taf.28, N118]; 39 – [Riis, 1970, p.33, 36, fig. 9] 40 – [Frankfort, 1939, pl. XLV], is stored in the Louvre AO 15772.

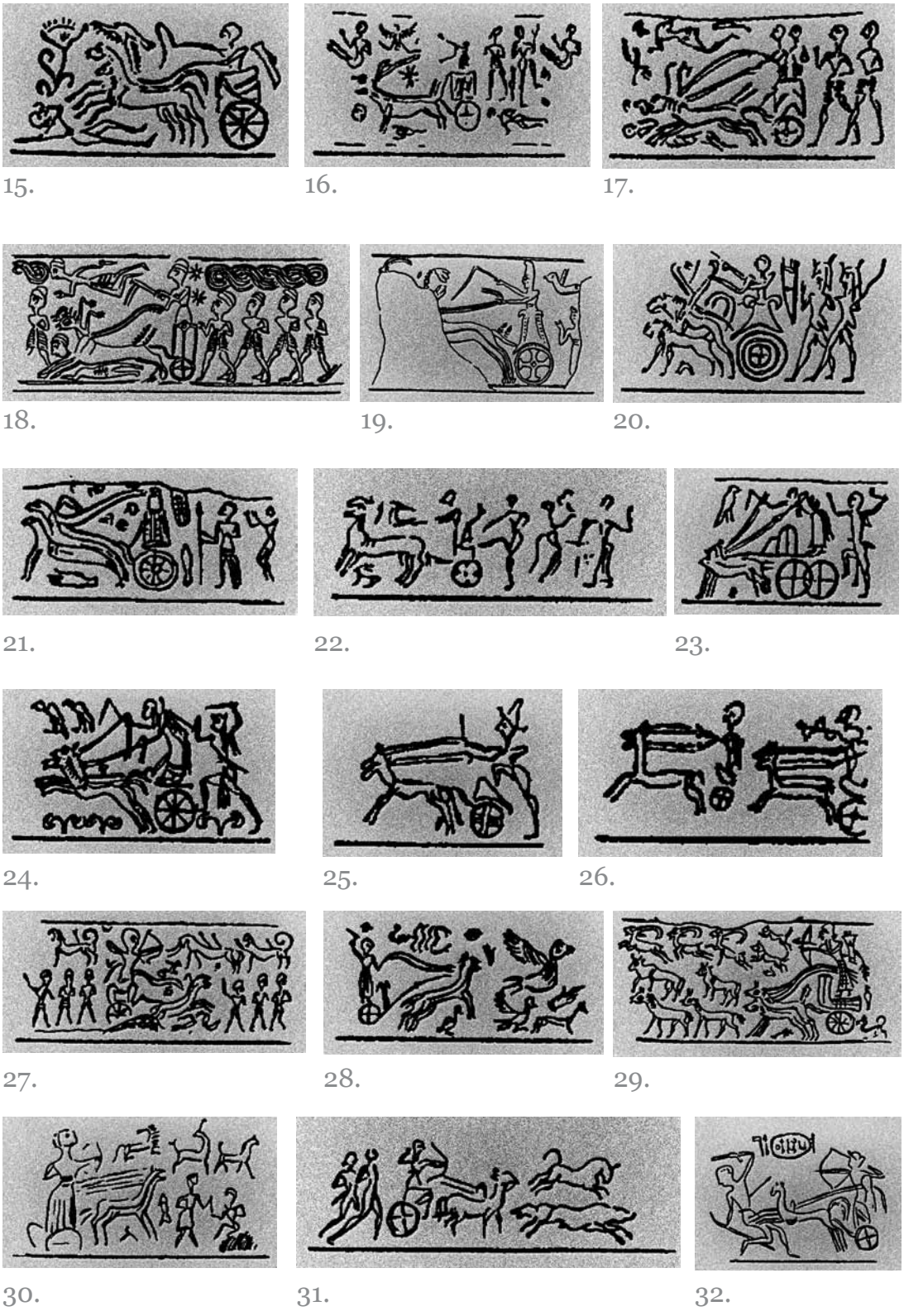

Fig. 171. Near East. Prints of cylinder seals. Continued.

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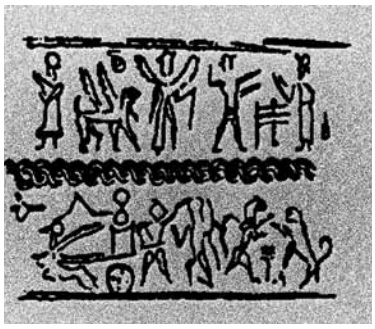

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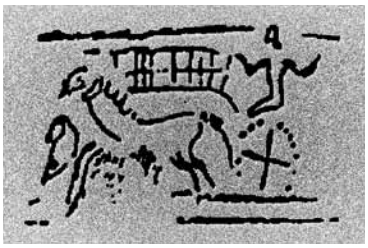

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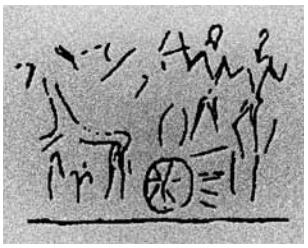

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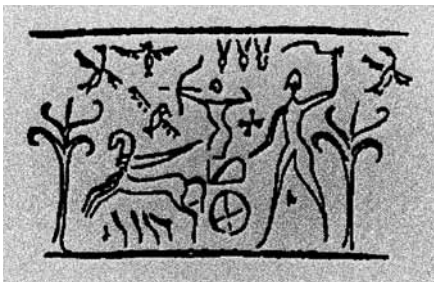

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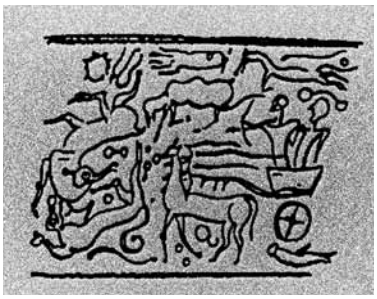

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Fig. 172. Near East. Prints of cylinder seals. Continued.

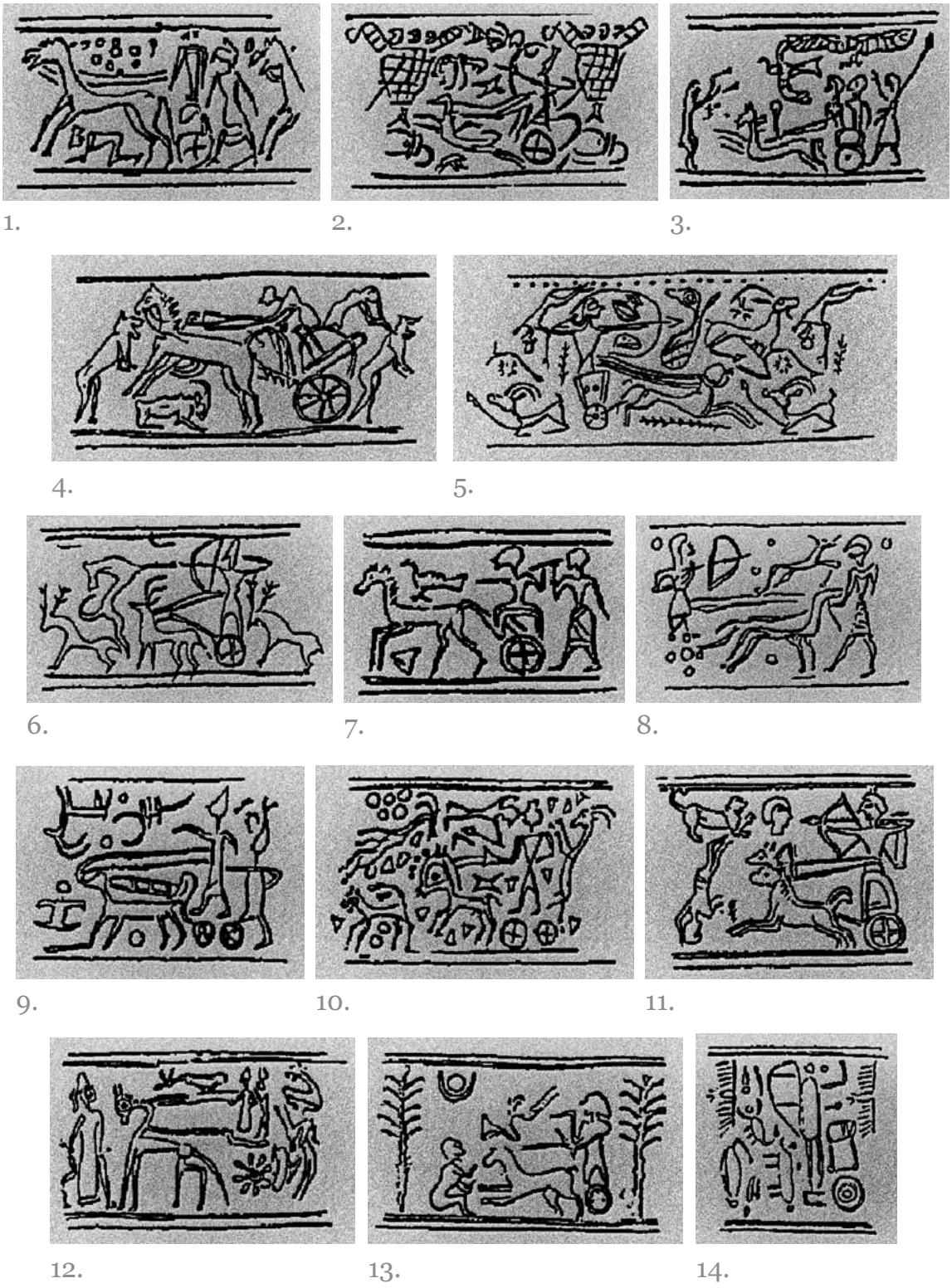


Fig. 173. Ugarit (Ras Shamra, Syria). Prints of cylinder seals. Paris, Louvre. From the Department of Oriental Collections. [Amiet, 1969, p. 1-8, fig. 1-3, 5, 8-9].

were fish and horse. The deity is associated with the cult of fertility, horse taming, was famous for chariot races. Poseidon-Gippios was a central figure in the Mycenaean pantheon (Pylos), there is no conclusive evidence that he was the god of the sea in the period preceding the appearance of «The Iliad» [Langdon, 1989, p. 198-200].

Despite all complexity of a problem of emergence of male deities of the Mycenaean pantheon [Bartonek, 1991], I assume that they could be evolved under the influence of the steppe religious and mythological concepts. Sacrifices of fish and dog are fixed in the Petrovo-Sintashta tombs with chariots. The observed similarity of «the pictorial series» in so remote from each other graphic monuments could result from active contacts and interactions of steppe pastoralists groups and the Near East peoples, an important indication of their ethnic kinship. ■

Asian chariot petroglyphs

It seems that the term is most informative to characterize rock carvings of chariots and vehicles, definitely belonging to the Asiatic chariots complex. These petroglyphs are linking two geographically distant areas of spread of chariot systems, the Ural-Kazakhstan and the ancient Chinese, allowing to view them as an important evidence of evolution in space and time a chariot complex.

Identified earlier petroglyph subtypes are in good agreement with the above types of chariots from the Chinese chemakyns: the most archaic type of a single-seat chariot without a handrail with a small round or rectangular platform is most relevant to all four subtypes of five selected images of chariots.

Subtype 1 – «A»-shaped chariot, apparently, is associated with Western or Middle Eastern chariots complexes; in the eastern part of Eurasia these images are known only on rocks of the Yenisei river valley. A finding of «the Gobi quadriga – a linked chariot» in Hovd Somon, is yet sole in this series in Mongolia. A discovery of 'A'-shaped chariot in Deccan, India, on a vessel (Fig. 168:5) indicates direct active contacts of Harappa, ancient Middle and Near East, very active in the preceding period and not necessarily connected to advancement to south of the steppe clans.

The Asian chariot complex is characterized by images of a charioteer and a chariot in plan, where two harnessed horses are shown back to back in a standard position

that corresponds to the fifth subtype. This stable pictorial tradition, let's call it «Indo-Iranian» conditionally, quickly spreads over a large area and traces movement of their natives on a map. This series also includes chariot images of the second, third (version 3.1-2.) and fourth (version 4.4) subtypes.

Specificity of rock art images does not allow a reliable recording of features of many design elements, for example, the front rail for a charioteer, which greatly complicates the separation of the entire array of images. However, the chariot petroglyphs help identifying some elements of the earliest structures, namely, stretch belts, fastening the most vulnerable chariot nodes, which could not be preserved in graves.

Larger platforms, two persons, changes in iconography let identifying in the series the chariots, close to double-seat chariots of the Western Zhou time. However, their appearance on rocks is unlikely to happen before the middle of the second millennium BC. Quantitatively, they are represented by single specimens in the whole array of Asian chariot petroglyphs.

The observed iconographic difference between the «realistic» and «sketchy» images may be indicative of two stages in development of the graphic art: the «passionate» period (20-19 cc. BC) associated with the active advancement of population from the Ural-Kazakhstan steppes, along the spurs of the Altai Mountains to the Mongolian steppes and the Ordos area, and the stable period of cyclical migrations (18-16 cc. BC), associated with development of new pastures and development of new territories.

In general, the dating of the «Indo-Iranian» pictorial tradition in the chariot petroglyphs is determined by the first quarter of the second millennium BC, the period of active migration of clans, suddenly abandoning the Archaim and Sintashta (as was suddenly abandoned the capital of the Hittite kingdom, Boğazköy-Hattus, or Gonur Tepe) and cyclically wandering in the eastern latitudinal direction towards Ordos. For sure, some of these societies moved to south, across rich pastures of Kazakh Law Hills to the fertile Fergana valley and further south to Harappa.

Another genetically related pictorial tradition, let's call her «Indo-Aryan» or Tokhar, is represented in Asian chariot petroglyphs by: subtype 1, «A»-shaped chariots; subtype 3, variant 3.3, possibly 3.4; subtype 4 variants of 4.4, 5.6 and 7. This series there are small single-seat and big two-seat chariots also distinguished, which, with a high degree of probability may be indicative of their different chronological positions.

This tradition, which is probably more archaic, is characterized by a slightly different vision of a perspective of a chariot image on rock. This is manifested in a different angle of viewing an image, approximate to the «profile» projection. So, wheels are always shown one above the other and often in a standard «plan» projection, and a charioteer is shown in «profile» with a prominent sex sign, and so draught animals («one above the other»).

This style is very similar to earlier images of vans and gigs of the Minusinsk Basin of the preceding period and corresponds to the archaic steppe rite of burial of real vehicles. Not surprisingly, the «A»-shaped chariots were recorded only on rocks of this region and, obviously, are associated with local development of societies, descending from earlier Western migrants of the preceding «first wave» and somewhat other channels of communication, which they used.

At the same time, the whole series of chariot images have more wider geography of analogies in, so to speak, classical, «canonized» appearance as in the western

monuments in Scandinavia (Kville, Frennarp), Italy (Camonica), in the above series of Syrian cylinder seals and southern chariot petroglyphs of Kazakhstan, Kyrgyzstan, Pakistan and India. It is noteworthy that only the monuments of southern and eastern foothills of Kazakhstan and in Saimaly Tash in Kyrgyzstan, show a combination of both examined traditions which could be explained by the active interconnections, contacts, and migrations of the local Indo-Iranian, Tocharian and Indo-Aryan population in the steppe and foothill areas of vast Kazakh steppe and the «squeezing out» of a surplus population through the mountain passes to south and east directions.

Dating of this tradition is also determined by the first quarter of the second millennium BC with an option of its antiquating as soon as accumulates new data and artifacts.

In general, the Asian chariot petroglyphs, like a communicative channel, shows clearly a trend in its development «from realism to schematics», from an image to a sign. This channel of communication in steppes by the middle and in the third quarter of the second millennium BC gradually loses its value, as role and importance of chariotry change in life and ritual practice of local societies. A new class of riders emerges who quickly adopt the social functions of charioteers and form new channels of own communication on the basis of other innovations and life values.

A revival of the chariot communication channel is observed later in the second half of 1st millennium BC, under different historical circumstances, in the contact zones between steppe pastoralists and sedentary ancient civilizations: in early dynastic China, during mutual hostility between the first Chinese states and their unification into a single power, in a period, when the role of chariot emperors in comparison to riders was still meaningful; in Assyria, in the form of excellent chariot palace reliefs, where the needs of classic oriental despotism demanded «miraculous» effects on enemies and own peoples; and, of course, in ancient Greece, well-known to everyone pupil through their chariots.

Summing up the issue of dating, I'd like to note that the types of real chariots from the burial grounds are consistent with the proposed classification of rock images. Archaeological data allow us to date the majority of the identified types and subtypes of chariot petroglyphs. Ambiguities in defining the chronological positions of archaeological cultures identified in the steppes of Eurasia requires further study of historical processes and trends which resulted in the spread of the chariot portraying tradition over a wide area. ■

Chapter 4

Ethno-cultural situation in the era of chariot

On origin of the steppe archaeological cultures

As a result of various ethno-cultural processes by the mid 2nd millennium BC, in the steppe band of Eurasia large tribal groupings were formed, an origin of each of them is a subject of numerous and sometimes controversial discussions, resulting, as a rule, in distinguishing multiple transitional variants or chronological horizons.

There is no reliable method of determining an ethnic basis of archaeological cultures of the steppe. Discrepancies by stages are reflected usually in changes in a technology of making certain types of things. A degree of knowledge accumulated on western and asian monuments of Eurasia differs significantly.

In order to identify common regularities and clarify dating, let us briefly discuss some current views on formation of some steppe cultures of the Bronze Age at the end of 3rd – first half of the 2nd millennium BC.

As a «chronological reference», I use a series of calibrated radiocarbon dates published in a series of works by I.V. Chechushkov and A.V.Epimahov [2004, p.39-45, 2006, p. 168-182, 2008, p.205-211, 2010, p. 182-229].

In regard to origin of the Volga Timber-Grave cultural-historical community (CHC), there are two hypotheses: according to the first, the Poltavkino culture antiquities are determined as a main component in its origin [Kachalova, Vasiliev, 1989], according to another, the genesis of the Catacomb and Abashevo monuments created the basis of the Timber-Grave culture [Piatykh, 1990, p. 113; Miller, 1990, p. 103-107, see: SA, 1990, N 1, p. 103-131]. The first concept is based on similarity in ground pit burial rites; pits being sometimes covered with a wooden structure; a flexed position of the buried, and some forms of ceramics. Proponents of the second concept emphasize that within the Poltavkino culture with small amount of materials, there are no solutions to the issues of origin of individual forms of Timber-Grave's dishes, placement of the buried, ornament types, and on tools and jewelry [Piatykh, 1990, p. 113].

Without going into detail of the discussion, I note that many researchers single out the Pre-Timber-Grave chronological horizon, when thinking about origin of Timber-Grave antiquities. Studies of Pokrovka mounds are important in this regard, because their materials revealed a Novokumak [Agapov, Vasiliev, Kuzmina, Semenova, 1983, p. 15], or Pre-Timber-Grave, [Otroshchenko, 1990, p. 107-112; Berezanskaya, 1978] chronological horizon, justifying the synchronicity of Seima Turbino antiquities with Petrovka and Abashevo (Tur-

bino) and with Early Timber-Grave and Alakul' (Seima) monuments [Bochkarev, 1986, p. 101, 107-109].

Analyzing the materials of the Alabuga burial mound in Upper Tobol and other Early Alacul' monuments, T.M. Potemkina comes to the following conclusions [1985, 1990, p. 118-130]: Early Poltavkino dishes by a number of features is comparable to the pottery of Odinovo-Krokhaliovo and Vishnevo types, which is the basis of Early Alacul's dishes in the Trans-Urals and Northern Kazakhstan. Such similarity is conditioned by an underlying cause of the ancient Pit's culture, reliably detected in the Urals and more eastern areas up to the Tobol. Along with the Poltavkino, the Catacomb influence manifested in similarity of vessels, implements and funeral rites, is marked in the steppe zone of the Urals and further to east. The Catacomb impulses, apparently, reached the Southern Urals through Poltavkino population and influenced the Petrovka and Sintashta complex types. In the southern forest-steppes, a similar role in the development of Petrovka's antiquities was played by Abashevo tribes. It is confirmed that during certain time interval, the Poltavkino, Catacomb, Abashevo, Early Alacul' populations coexisted; and in each case it was associated with a certain natural and ecological niche.

In development of either the Timber-Grave, or the Alakul' cultures, along with a local stratum, the Abashevo and Catacomb groups in varying degrees participated as well, which explains the proximity between the Alakul' and the Timber-Grave cultures on a mature stage. Activity of the Alakul' culture natives, at the beginning, was directed to west, on Abashevo, Poltavkino, Catacomb and Early Timber-Grave populations; later the east and north directions became prevailing because of the contacts with Fedorovo and Cherkaskul populations, while maintaining contacts with Timber-Grave tribes, including the Don and the Dnieper [Potemkina, 1990, p. 123-124; Pryakhin, Matveev, 1988, p. 157-158; Berezanskaya, Hershkowitz, 1983, p. 100-110].

An early stage of the Timber-Grave CHC is defined by researchers in very different terms, but a question on a place and a taxonomic level of the Pokrovka type of monuments, having the most expressive chariot attributes, often accompanied by sets of arms, became, in essence, a stumbling block. Chariot finds (16 exemplars of psaliis and horse sacrifices) are tied to the Pokrovka (Pokrovka-Mayevo as per V.V.Otroschenko) part of the Timber-Grave culture.

Searches for harness items analogies normally lead, first of all, to the most geographically approximate the Potapovo and the Don-Volga Abashevo monuments. Disagreements concern few key issues: an origin of Pokrovka antiquities, a degree of autonomy within the Abashevo or the Timber-Grave CHC; participation of natives of these traditions (including the Sintashta ones) in the genesis of the actual Timber-Grave culture.

A small series of calibrated dates of Early Timber-Grave monuments of the Volga region appeared to be chronologically compact, 1950-1660 (2050-1400) BC. Virtually identical numbers can be presented for few analyzes of the Urals version of this culture, 1880-1740 (1920-1690) BC [Epimakhov, 2008, p. 93-95].

The Abashevo CHC, 2200-1650 (2500-1100) BC, is represented by three local variants: the Middle-Volga has no chariot attributes; the Ural has single finds of psaliis outside of closed complexes (settlements and occasional finds); and the Don-Volga has a whole series derived from separate burials, a pair of psaliis (including those made by one master) and a small

series of horse bones. Although no vehicles were found, the local population undoubtedly was acquainted with chariots; this is directly confirmed by findings of psaliis with traces of wear and, indirectly, by huge number of identified items (30 items).

Abashevo samples, no doubt, are the product of lasting technological and cultural development, but reliable prototypes are unknown in northern Eurasia. Often, burials, containing findings of harness details, are accompanied by articles of arms, including the status ones. Another feature of this series of burials: usually they are not part of necropolis and were studied in single or twin mounds [Epimakhov, 2008, p. 93-95].

Monuments of the Potapov cultural type, 2020-1600 (2300-1500) BC, of the Middle Volga (Potapovsky and Utevka IV burial mounds) provided 15 perfect exemplars of horn and bone psaliis. Authors of the study of the Potapov burial ground relate its genesis to mixing of local Poltavka-Abashevo population with the migrant one, arriving from beyond the Ural Mountains, an area occupied by Sintashta culture natives. Design features of the psaliis partly refer to direct analogues in the Don-Volga Abashevo monuments, partly in the Sintashta monuments [Epimakhov, 2008, p. 93-95].

The Sintashta culture, 1970-1770 (2030-1750) BC is expressed in remains of at least 13 chariots and 46 exemplars of psaliis. Technological and typological analysis suggests that these items, like the Abashevo, are products of lasting technological and cultural evolution; however its initial stages were not yet reliably identified.

I.V. Chechushkov and A.V. Epimakhov believe that the Sintashta tradition of making the psaliis cannot derive from the Abashevo tradition, as there is no reason to believe that the Abashevo products are the Sintashta derivatives. All products have a stable set of typological traits, are equally complex in making and are identical in terms of horse management [Epimakhov, Chechushkov, 2008, p. 205-211].

The Petrovka culture, 1880-1740 (1930-1690) BC, in opinion of G.B. Zdanovich, developed on a local basis, under the most tight interaction with the western Abashevo and the Early Timber-Grave tribes, and not without influence of southern agricultural cultures [Zdanowicz, 1988, p. 139], is genetically linked to Sintashta and fully duplicates its chariot traditions [Chechushkov, Epimakhov, 2008]. The possible local ingredients are post-Botai and Surtandy-Tersek population, the other component are forest-steppe groups, who left the monuments of the Vishnevo type.

Notable are findings from the Petrovka and Sintashta burial grounds of flint arrowheads with handles, separate types of bronze objects specific to Seima Turbino weapons. Monuments of the Sintashta-Petrovka range had their share in laying foundations to the Alakul' culture developed in Kazakhstan and neighboring regions in the first half of the 2nd millennium BC.

The Alakul' culture, 2300-1500 (2600-1400) BC has just about twenty artifacts of the chariot complex and for a while one chariot burial (Nikolaevka II); there are grave slabs with the horse image, the facing humans of Tamgaly, the Mugodzhar rock images of chariots [V.V. Tkachev, 2002]. It is likely that this series will increase in number with new findings upon purposeful search.

The Fedorovo culture, 1750-1320 (1900-1250) BC. Some researchers believe that the monuments of this type coexist with the Alakul' ones, having their own individual origin [Kosarev, 1965, p. 244-246, 1981. 81]; others believe that they are genetically related and chronologically

follow the Alakul' [Zdanowicz, 1988, p. 244-246; Avanesova, 1979, p. 24]. Upon the analysis of ceramics, E.E. Kuzmina suggests the origin of this culture in central Kazakhstan from the local Eneolithic monuments [1988, p. 95-97].

A.A. Tkachev supports the identification of early and late stages of this culture, but links its origin to migration of Andronovo-Kanay population from Eastern Kazakhstan to Sary-Arka, and of a second group from the Pavlodar Irtysh region along the Ishim-Irtysh watershed, which led to formation of two different cultures, Atasu and Nura, coexisting in the Kazakh Law Hills in 16-14 cc. BC [Tkachev, 2011, p. 155-159].

In this area, however, Fedorovo burial mounds or settlements which could correspond by all basic characteristics of the funeral rites, ceramics and inventory to the classical Fedorovo monuments of the the Minusinsk Basin [Maksimenkov, 1978] or the Trans-Urals, are unknown [Salnikov, 1951, 1967]. Neolithic and Eneolithic monuments in Central Kazakhstan are still in the initial stage of their study.

It appears that the actual origin of the Fedorovo culture can be related to the post-Afanasievo monuments of the Trans-Urals and the Minusinsk basin, dated on the first stage to 17th-15th cc. BC, as they were dated by first researchers [Salnikov, 1951, 1967]. Interaction of natives of the Fedorovo and Alakul' cultures was determined in this period by rather matrimonial and family relationships of two genetically related groups. In the period of 15th -13th cc. BC, these contacts were intensified and adopt a character of local north-south migrations, which was manifested in the appearance in the Ural-Kazakhstan steppes of monuments with predominant features of Fedorovo [Zdanowicz, 1988, p. 244-246].

I think that a term ***«the Andronovo cultural and historical community», 1610-1410 (1740-1400) BC,*** can only be applied to the mixed Alakul'-Fedorovo type of monuments, located in the steppe regions of Kazakhstan and Central Asia.

The Karasuk culture, 1440-1130 (1450-1050) BC. Principal monuments are located in Southern Siberia, Mongolia and North China (Ordos), with well-presented hereksurs and deer stones. In recent years, radial-beam surface structures, built over graves, were revealed as part of the Karasuk antiquities [Bokovenko, 1999, p. 175-176]; they are known among the Begazy-Dandybay antiquities [Chugunov, 2002, p. 142-149; Epimakhov, 2008, p. 93-95].

Found among the Karasuk monuments were slabs with chariot images, chariots harness details (yoke models) and a charioteer's set of weapons, whose production is based on the sleeve-type casting technology.

The Karasuk monuments are synchronized with the Chinese Shang era, radiocarbon dates of which differ from the traditional chronology of China. According to the C14 method, it is a period of 1700-1050 BC or 1600-1046 BC upon comparison of the dendrochronological and radiocarbon scales. With accumulation of the series, there might be some narrowing of the range, and the two systems wouldl be better correlated [Epimakhov, 2008, p. 92-96].

There are two basic concepts of origin of the Karasuk culture: the «autochthonous» [Kiselev, 1951; Gryaznov, 1955, p. 22; Novgorodova, 1989, p. 120-140; Vadetskaya, 1986, p. 60-61] and «the migratory» [Chlenova, 1967, p. 124, 1976, p. 11-16, 71-72]. All researchers are unanimous that this vivid and unique culture, «fundamentally different from the preceding Eneolithic cultures» [Gryaznov, 1957, p. 22]. Division into «autochthonous» and «migratory»

concepts is rather conditional, since the proponents of either hypothesis do not exclude the migration of any part of Karasuk culture natives. The differences lie in interpretation of the genetic cultural basis and directions of local displacements.

S. Kiselev believed that the appearance of the Karasuk culture in Southern Siberia is associated with an influx of new population from south-east, i.e. from northern China. M.P. Gryaznov defined it as a purely Southern Siberian phenomenon, derived from the Andronovo monuments. E.A. Novgorodova, supporting the concept of S. Kiselev and basing on statistical materials processing methods, came to the conclusion that tribes of Mongolia, Tuva and Southern Siberia in Karasuk time had an ethnic bond, being caused by «a great wave of migration that swept from the mountain-steppe regions of Central Asia to north-west to the Yenisei and west of Mongolia» [1989, p. 130].

All these hypotheses do not explain a reason for advanced skills in metal processing and bronze casting characteristic to Karasuk tribes. A well-developed Eneolith tradition of tin bronze processing and the sleeve-type casting were not fixed in China.

N.L.Chlenova attempted to remove this contradiction by linking the origin of Karasuk metals with Luristan bronzes in Iran. She assumed penetration of Karasuk elements from Iran through Afghanistan and Xinjiang to Mongolia, and from there to Southern Siberia, Tuva, northern China, and the Trans-Baikal region. Another branch of the Karasuk community spread westward to Central Europe [Chlenova, 1967, p. 124]. However, it soon became clear that Luristan bronze cannot be dating from a period before 12th cc. BC [Ghirshman, 1979], and some of the Zivie findings were simply forgeries [Muscarella, 1977, p. 197-219].

E.A. Novgorodova, criticizing the concept under consideration, have justly noted that the «animal style» in the Zagros Mountains appeared with already established canons and forms that are not associated with traditional animal images in Iran [1989, p. 128].

Of fundamental importance seem to be the areas identified by N.L.Chlenova of spread of early Karasuk daggers [1976, p. 70-72]. The most archaic daggers, according to the author's typology, found in the Minusinsk Basin, Ordos and Inner Mongolia, as well as in the Middle East, the Caucasus and northern Iran. Daggers are of same type were among the findings from Eastern and Central Kazakhstan, and in the west from the steppe Trans-Urals (Bashkiria). There are single daggers of this type known in Ukraine and further to north-west of the Black Sea region.

I think after the N.L.Chlenova and L.S.Vasilyev that the Karasuk and the Yin cultures «genetically traced back to a third bronze culture, not yet sufficiently known» [Vasiliev, 1961, p. 55]. Surely, such a culture can be antiquities of the ***«Seima Turbino transcultural phenomenon»***. Although the Seima Turbino type monuments scarcely number over twenty, they are common to an area of approximately 3,000 sq. km, from Moldavia (Borodino hoard) to Southern Siberia (Rostovka). Many authors are careful in regard to genetic ties between natives of the Seyma–Turbino and the Karasuk cultures, but all agree on significant similarities between daggers of Karasuk and Seima Turbino, and most importantly, on the technology of their production and in regard to binding to tin deposits in areas of the Upper Irtysh and the Mountainous Altai [Chernykh, Kuzminykh, 1989, p. 256-259].

Absolute dates of the Seima Turbino antiquities are traditionally defined by the 2nd quarter of the 2nd millennium BC by

the Balkan-Mycenaean «binding» line, based on similarity with materials from the shaft graves at Mycenae: bone shield spiked psaliis, and silver spear tips, coming from the Urals metal processing centers and found in the Borodino treasury (Moldova).

The Seima Turbino transcultural phenomenon now has one date calibrated by the Satyga burial ground in Western Siberia of 2125-1955 (2140-1940) BC, and three dates calibrated by the Ust-Vetluga burial ground in the Middle Volga of 1910-1620 (2020-1600) BC [Chechushkov, Epimakhov, 2010, p. 182-229].

Z.S. Samashev [2010] synchronizes these calibrated dates taking into account the new Mycenaean dating, correlated by the dendrochronological scale to 18th-17th cc. BC and is guided by new dates of 17th-16th cc. BC for the Erlitou culture in China and 21th-17th cc. BC for Zardchahalifa in Tajikistan [Bobomulloev, 1993, p. 56-63; Kuznetsov, 2002, p. 81-82].

In a hurry, as it seems, E.N. Chernykh and S. Kuzminykh reject the hypothesis of M. Loer on a west, steppe momentum associated with tribes of Andronovo cultural-historical community [Loehr, 1956, p. 86], because he compared much later monuments of the early period, not that of Sintashta-Petrovka.

Lin Yun identifies the so-called «north complex» of monuments of the Shang and Zhou periods, localized in north districts of China and Inner Mongolia, and separates them from the synchronous monuments of the Chinese Central Plains [Lin Yun, 1986, p. 237-273, Lin Yun, 1990, p. 29-45]. Analyzing the bronze ware of the «northern complex», he identifies the following types of objects: daggers and knives with tops shaped as animal heads and figurines, bronze axes with tubular sleeves and golden jewelry (temple rings and earrings with a bell).

The selected types of objects are comparable to that of Seima Turbino and the jewelry are characteristic to materials of the Andronovo community. Lin Yun notes that «a question when the bronze items of the northern complex first appeared in China still awaits further investigation» [1990, p. 33] and recognizes an influence of steppe tribes of Central Asia on formation of the «northern complex», with the undeniable originality of the Central Plains cultures. However, the «northern complex» does not contain materials which could explain an origin of bronze sleeve-type casting technology, in forms, based on specific tin additives. Nor there are data which would allow assuming the appearance of this tradition in the monuments of the «northern complex» or the Central Plain of China.

It seems that this tradition could arise in the indicated areas under influence of Seima Turbino, which apparently became the basis of the later emerging Karasuk culture. Originally, it was localized in areas of North China and Inner Mongolia, and then, as a result of interaction with the Central Plains cultures, expanded its influence to Southern Siberia and Kazakhstan.

Theoretically, to overcome then such a distance in a relatively short historical period could only be possible by using wheeled vehicles, and above all, the chariots. A «miraculous» view appeared on a divine weapon in general and the dagger in particular, apparently, yet in Novotitorovo environment, as manifested in various geometric patterns on their handles, in their tops, not yet figurative [Gay, 2000, . 165, fig. 50]. This communicative idea appeared in the Asian part of the continent together with colonists of the «first wave» and was further developed locally in a unique tradition of figurative decoration of the Seima Turbino dagger tops. ■

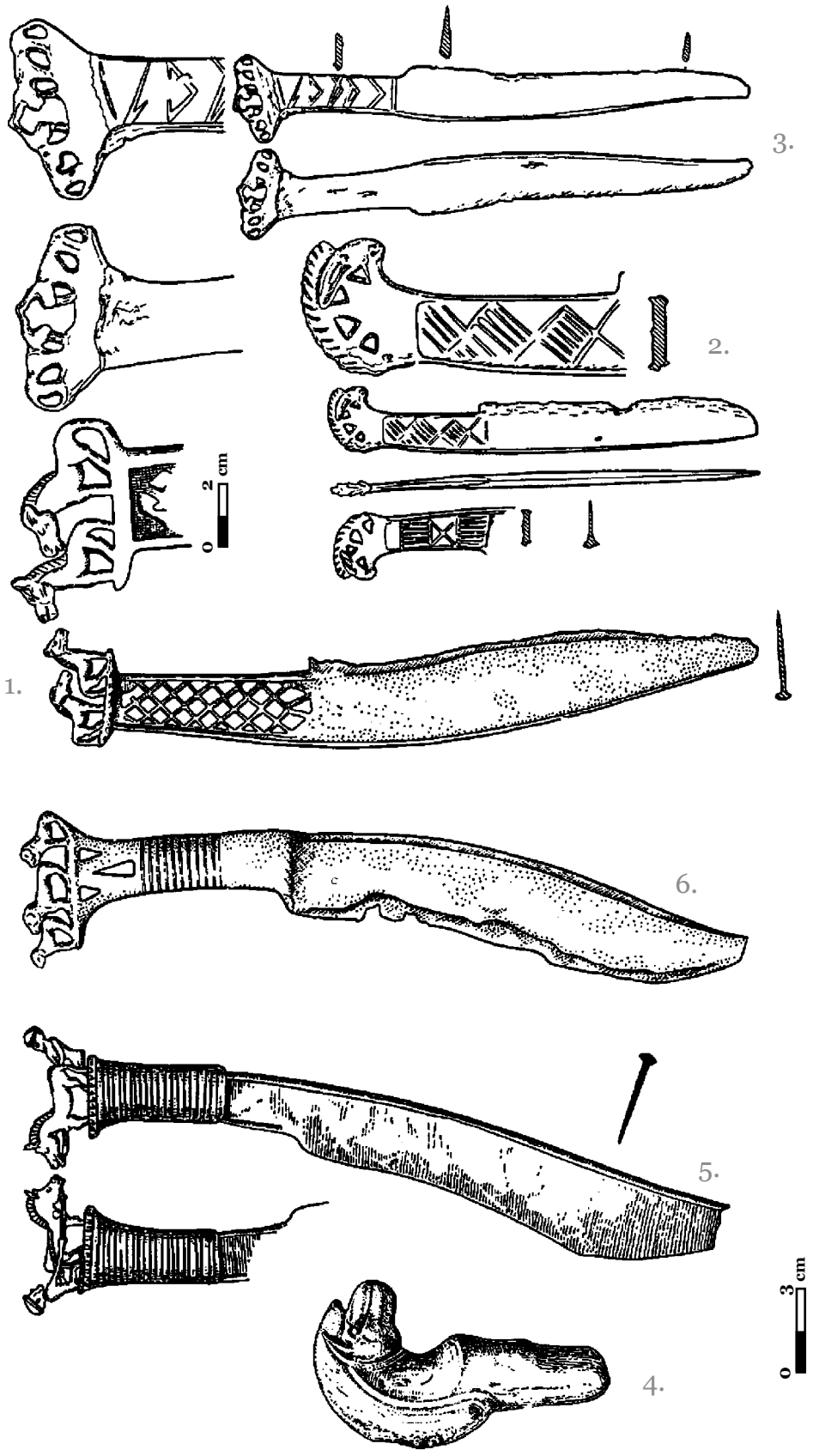


Fig. 174. Seima-Turbino parallels. 1 – Seima; 2 – Elunino I; 3 – Jumbo; 4 – Irtysh, 5 – Rostovka; 6 – Turbino II; 1-3, 5-6 – bronze; 4 – stone. [Chernykh, Kuzminykh, 1989; Matyuschenko, 1991].

Chronology and Seima Turbino pictorial tradition

Important confirmation of the above hypothesis is provided by an analysis of rock art monuments. Upon stratigraphic observations of ancient images overlapped by «younger» images, among the steppe Kazakhstan petroglyphs three layers were identified. They are mutually interrelated, clearly reflecting consistent developments in a manner of depiction of the same characters over time and within a single pictorial tradition [Novozhenov, 2002].

The first layer gathers figures of «sun-headed» creatures, animals with bound feet, men with «tails» and emphasized phalluses. The images are performed in «naturalistic» style; postures are predominantly static.

The second layer contains images of animals in the so-called «skeletal» style. The figures were subjected to certain schematization and dynamism. This is observed in changed postures of animals, appearance of new details: projections on withers, legs sloping in front, stylized horns, and rounded contours of the figures.

The third layer represented by figures of animals, executed in a manner close to the canons of the Scythian-Siberian (Saka) animal style.

Horse figures of the first layer have often an emphasized mane, sometimes an overhanging forelock (Fig. 174-175). This element is also characteristic to a camel image. This is how horses were depicted in bronze on sculptural tops of metal items, mainly daggers, from a Seima Turbino range of monuments, brightest samples of which were singled out into a type of the Seima Turbino weapons [Chernykh, Kuzminykh, 1989, p. 122].

A list of analogies includes findings from southern regions, the five daggers from the Second Karakol treasure, discovered accidentally on south-east shore of the Issyk-Kul Lake [Vinnik, Kuzmina, 1981, p. 48-53]. Ornamental dagger handles end in sculpted figures of animals, three of which survived in fragments and two others reflect a horse with a gorgeous mane and an ibex. Their legs are beveled forward.

In the Mynshunkur burial ground (South Kazakhstan, Fig. 175A), a golden temporal ring was found with a bell and horse figurines, similar to that on top of a dagger from the Seima burial ground [Akishev K.A., Akishev A.K., 1983].

Another group of analogies is represented by occasional finds of stone tops and «rods» in the form of a horse head [Chernikov, 1960, p. 85-86, 88]. An accidental finding of a bronze horse figurine with great mane on a stand comes from the Minusinsk Basin [Pyatkin, Miklashevich, 1990, p. 147, fig. 1-8].

A significant series of analogies and petroglyphs of this style were identified from the East Kazakhstan monuments and investigated by Z.S. Samashev [1992, p. 204, 2010]. It is noteworthy that a two horse-drawn Pokrovka chariot (Fig. 175:1) were portrayed in Seima Turbino style, and

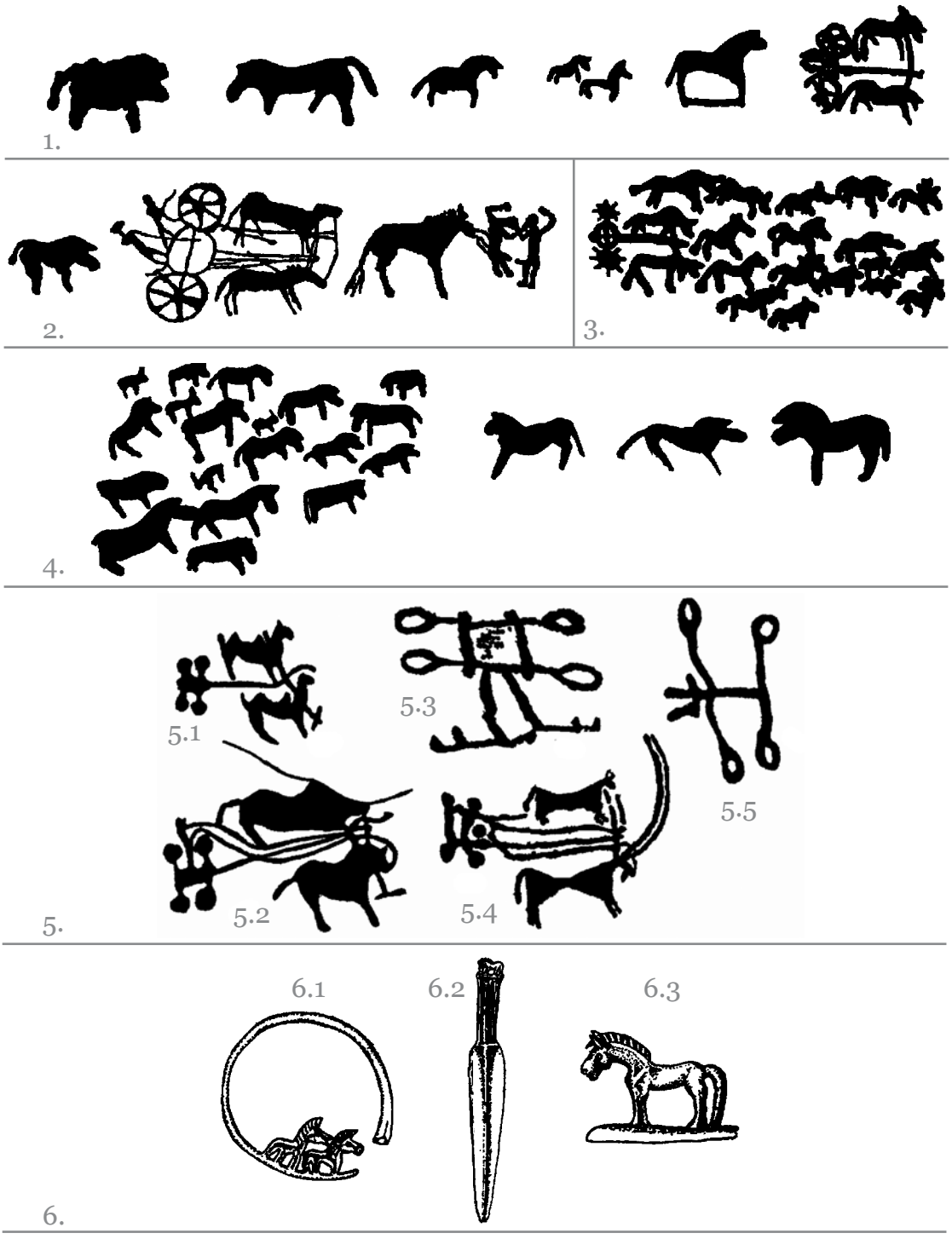


Fig. 175. Analogies from neighboring regions. Petroglyphs and small plastics. 1 – Eastern part of Kazakhstan – Saur-Tarbagatai, Moinak, Okey, Kurchum [Samashev, 1992]; 2 – Prityanshanie and Kyrgyzstan – Eshkiolmes, Saimaly Tash [Sher, 1980, Mariashev, Rogozhinskiy, 1991]; 3 – Gorny Altai – Zhalgys Tepe [Pyatkin, Miklashevich, 1990]; 4 – steppe zone of Kazakhstan – Terekty, Zyngertau; 5 – Image of vehicles: 5.1-2 – Baikonur III, plane 2; 5.3 – Kurchum, East Kazakhstan [Samashev, 1992]; 5.4 – Saimaly-Tash, Kyrgyzstan [Sher, 1980]; 5.5 – Elangash, Gorny Altai [Okladnikov Okladnikova, 1985]; 6.1 – golden temple rings from the Mynshunkur, South Kazakhstan [Akishev, Akishev, 1983]; 6.2 – bronze dagger from the Second Karakol treasure, Kyrgyzstan [Vinnik, Kuzmina, 1981]; 6.3 – a bronze sculpture from the Minusinsk Basin [Pyatkin, Miklashevich, 1990].

Fig. 176. Kazakhstan. Mynshunkur. [Akishev, Akishev, 1983].

horses are placed one above the other; all of these features put it in contrast to classic images of Asia. A triga from Moinak, rare for Asian petroglyphs, is depicted in a similar style, more schematically though. An archaic variant of the chariot's design, an explicitly «foreign» appearance sharply distinguish them from the entire series of chariot petroglyphs.

The above described analogies both in small plastics and in petroglyphs allowed separating the Seima Turbino pictorial tradition in the rock art of Central Asia [Pyatkin, Miklashevich, 1990, 146-153, in the light of criticism of the concept, see Novozhenov, 2002].

Chronological frames of the first layer are determined by the horse images with great manes, vehicles, and «sun-headed' anthropomorphic figures at the first quarter of 2nd millennium BC. There are significant upper date tolerances for this layer, as evidenced by «Pre-Okunevo» and Harappan parallels in depicting the «sun-headed» creatures.

Figures of animals, superposed the previous image layer, have characteristic iconographic features, namely: the «skeletal» style carving, legs are beveled in front, a small triangular protrusion on the nape. The animal species, representing the second layer of images, are: horses shown without the mane or forelock, mountain goats, cows, steppe antelope and deer. This group includes images of horses, amended into bulls, and animal figures, performed in a recognizable manner, close to the Saka animal style.

Upon the analysis of the Bronze Age images of various animals, especially, deers in the petroglyphs of Central Asia, and after their comparison with materials from the Arzhan 1 mound in Tuva, J. A. Sher identified a peculiar stylistic element: a triangular protrusion on withers of animals. It is a determining element for images of Late Karasuk time and correlates with an early stage of development of the Scythian-Siberian animal style [Sher, 1980, 1980a, p. 344-346].

Thus, two chronological layers of images were distinguished in the petroglyphs, correlated with the first quarter of the second millennium BC and the end of the second – the first half of the first millennium BC, which, respectively, could be associated with the Seima Turbino monuments and the Karasuk (karasukoid) tribes. In this case, throughout different historical periods remarkable are: the use of one sanctuary, of this very place, and of, probably, one channel of communication.

«Stylistically,» these two layers can be regarded as a natural development of one Seima Turbino pictorial tradition in the lasting continuum.

In the first half of the 2nd millennium BC, all over the Great Belt of steppes from the Carpathians and the Balkans to the Yenisei river, a number of societies has

formed; these were clans who owned two «miraculous» means of communication: fast mobile war chariots and the most advanced and the complex of weapons, perfect by standards of the time. It was indisputable and decisive advantage of these societies in the «geopolitical» context of the Ancient World, an important and substantial argument in external relations of the clans.

And what channels of communication could develop in between these communities within the «steppe world»? Most likely, all factors described in previous chapters were retained: factors of marriage and family, of neighbors, and by far not aggressive, thanks to abundance of free territories for new pastures. However, numerous data indicate the presence of at least two different traditions in the communication of these societies, which correspond to evidence of written sources.

Linguists documented the existence of several languages of the Indo-Iranian language branch: the Kafiri, which is observed with the Hindu Kush mountain people [Jettmar, 1975], the Indo-Aryan and the Iranian, and the Tokharian language, which documents the stay of Indo-Iranians in Turan. It is interesting that the language of the Avesta is void of non-Indo-Iranien substrates [Dyakonov, 1989, p. 21]. This means that the Avesta could be created only by natives of the above kin languages.

At the same time, with expansion of new pastures and natural growth of moving families, these clans were inevitably facing a resistance from the side of indigenous population; first clash was with population of the forest-steppe Seima Turbino circle. Some researchers define the character of the first contacts as not peaceful [Bochkarev, 1995; Goncharov, Bekhterev, 1999, p. 121-125], it was a conflict of two communication systems: the chariots vs. sleeve-type weapons of a passionate phase of communication; but very soon the relationship become synthetic, which was manifested in the mutual adaptations of advanced technological skills.

In any case, the Seima Turbino weapons and the technology of sleeve-type casting were actively introduced into the Early Andronovo environment and then rapidly spread in all contact zones, where steppe clans interacted with settled ancient civilizations. Advantages of a battle chariot and, accordingly, the chariot combat tactics, combined with advanced weapons and secrets of its manufacture, provided unprecedented domination and absolute superiority, equal in modernity, for example, to possession of an atomic bomb production secrets. ■

External channels of communication

External communication channels in an era of chariots are characterized by contacts between cattle-breeding and sedentary farming peoples. Those contact zones are: forest-steppes of the Great Steppe Belt, North China (Ordos), India, Transcaucasia, the Near Eastern civilizations, the Mycenaean civilization, and Turan. Active exchange and trade relations, integrating complex processes of mutual influence and borrowing of the material and spiritual culture elements developed in these areas. It is in these contact zones that the «miracle» of communication occurred during the passionate phase, – a synthesis of different cultures, the birth of new ethnics and traditions.

Determining factors. Communication channels of societies in the steppe Eurasia in the 2nd millennium BC were determined by three factors:

• Genesis of the post-Pit's groups of pastoralists settled in the vast area of steppe and forest-steppe zones by the end of 3rd millennium BC; their active contacts with the indigenous population and the formation of his own material and spiritual culture based on old traditions;

• Perpetual contacts between kin groups moving all over the steppe belt; marriage-family relations emerging between members of these groups; and natural exchanges and military conflicts because of pastures and livestock. The «motley» picture of archaeological cultures in the beginning of 2nd millennium BC in the steppe Eurasia indicates the active movements of various groups of the population, which obviously was a result of climatic disasters, and demographic changes. Thus, based on numerous analyses of soils from synchronous monuments, researchers of paleoclimate mark significant steppe aridization process and an associated environmental crisis at the turn of 3rd-2nd millennia BC [Demkin, 1999, p. 304-306], which stimulated the search for new pastures and considerable migrations along the numerous rivers and streams;

• Development of integrated economy of these societies: horse breeding, chariotry, clothing, metal processing and forging skills for producing bronze objects, as well as search for new pastures for horse herds, sources of raw materials for metal, copper ore deposits and mineral additives like tin and arsenic, mineral pigments for clothes.

E.N. Chernykh and S. Kuzminykh [1989, p. 266-278] proposed a relationship model within North Asia population, which is based on a comparison of metals from monuments with copper ore bases, geographically localized. Territorial «movement» of metal, recorded in archaeological cultures, defines main directions of interactions of different ethnic formations [Chernykh, Kuzminykh, 1989, p. 266-277].

According to this model, an ethnocultural situation at of end of 3rd – first half of 2nd millennium BC was characterized by the collapse of the Circumpontic metallurgic province and the beginning of formation of a new one, the Eurasian. Identified were:

• the phase of migration, composing, formation (a passionary phase);

• the phase of stable existence of a society.

The system of population's interrelations in the steppe and forest-steppe zone is defined by two opposing currents:

• the first, from west to east, is associated with the Trans-Ural metallurgical center of the Abashevo CHC and ancient deposits of copper ore in the Southern Urals, Tashkazgan and Nikolsky;

• the second, from east to west, the so-called «Great Tin way» connected to ancient tin development in the Altai Mountains. Use of tin as an additives allow mapping the path.

The Great Tin way. The large ancient tin mining sites were recorded in Eastern Anatolia, Afghanistan, Pakistan, Uzbekistan, Tajikistan, the Altai Mountains, the Sayans [Parzinger, Boroffka, 2002, p. 163-167], in the basin of the Upper Irtysh River in the east of Kazakhstan [Chernikov, 1949, 1960; Shtellner, Samashev et al, 2009, p. 228-238].

In Uzbekistan, ancient tin deposit developments were studied in Karnab-Sinkonchi, Chang'an, Lapaz, dated to 19th-17th cc. BC (calibrated by sigma 2), and associated with the Tazabagiab culture. In Tajikistan (Mushiston), where copper ore is very rich in tin and requires no additional additives, the ancient sites were dated to the end of 3rd – 2nd millennia BC, and are accompanied by pottery of the Andronovo appearance [Shtellner, Samashev et al, 2009, p. 230-231].

According to data of the spectral analysis, tin deposits of the Rudny Altai and the Upper Irtysh River became a place of formation of a metallurgical tradition with natives of Seima Turbino and Okunevo at the turn of 3rd-2nd millennia BC [Chernykh, Kuzminykh, 1989, p. 247]; from there the tradition spread across all Northern Eurasia. Penetration of the tin (sleeve-type) industry from the same region to the Northern and Western China is argued by K.M. Lindaff [2005, p. 25-35], and this is in support of the presence of an advanced communication channel between the cattlemen and the early Chinese kingdoms. Large ancient copper and tin development sites are also known in Central Kazakhstan [Kadyrbaev, Kurmankulov, 1992].

According to works of the Kazakh-German expedition in Askaraly, the Delbegety massif of the Kalbin mountains in the upper Irtysh, this field tin spread up to Mesopotamia and the Minusinsk basin in the east, where it was fixed that the Okunevo natives made alloys with tin from the Rudny Altai [Bearden, Garner, Gorelick et al, 2007, p. 122-123; Bearden, 2008, p. 48-52].

A territory, source of tin imports, overland, on mules and donkeys, is mentioned the Mesopotamian cuneiform texts. Presumably, these could be Turanian tin deposits, ancient mines in Iran, as well as in Eastern Kazakhstan. The sources of tin additives brought in Troy and Mycenae are not yet established [Shtellner, Samashev et al, 2009, p. 230].

Subsequent studies in this direction could remove many controversial issues; in any case, these new data illuminate directions and contacts of ancient societies, and obviously define them in many ways since bronze items and weapons were at the core of their business.

It is not yet possible to detail routes of tin «supplies» due to incompleteness of data, but periods were reasonably identified for global «collapse» of stable cultures, which led to new synthetic cultures, absorbing the features of the previous. It is at the turn of 3rd-2nd millennia BC, that such a break occurred in the chariot epoch, associated with their triumphant invention, use by the steppe societies and development of tin-base bronze-casting technology.

Exchange commodities. The very objects of trade exchanges and natural monopolies of cattle-breeders and farmers are an important determining factor.

The relationships were based on trading operations, which were rather barter deals [Jankowska, 1985, p. 3.8, 1986, p. 17-24]. Evidently, tin, as an indispensable component of copper ore smelting and bronze

casting, achievements of the chariot «industry», and, above all, well domesticated, trained horses became such objects of exchange.

It is unambiguously evidenced by the data of the earliest in the Old World domestication of horses in two mutually distant centers of steppe; by selection of breeds and of large herds, population of which is determined by osteological finds up to 70% in the herd [Grushin, 2011, p. 411-413]. It seems that wide geography of domesticated horses in 3rd-2nd millennia BC is the result of such exchanges [Bokony, 1984, see bibliography].

An interesting picture emerges upon results of spread of tin bronze objects in ancient Eurasia [Chernykh, 1991, p. 162-165, 1982, p. 6-20, 1978, p. 53-82]. Within the system of the Circumpontic metallurgical province two blocks were identified:

• the southern, cultures of which are localized in regions of Transcaucasia, Asia Minor, the Balkan and the Carpathians;

• the northern block of cattle mound cultures in the steppe regions of Eurasia. Many copper ore deposits are concentrated in the southern regions, in contrast to the northern territories, which were virtually void of own ore base.

Spectral analyses definitely show that a huge mass of metal was delivered from southern farmers and metallurgists to steppe pastoralists in the north. In the period of end of 4th – mid-3rd millennia BC up to 45% of the copper smelted in the south was reportedly sent to the «mound» peoples. In the period of mid-3rd millennium BC – 18th-17th cc. BC, this share increases sharply to 60%.

«In other words, we discovered for ourselves a whole industry of antiquity. It was a very complex and expensive (with respect to energy costs) system of long-distance relationships of different nations, reflecting, in essence, the international division of labor ... «[Chernykh, 1991, p. 165].

Magic of the red color. A tradition of decorating and polychrome painting of vehicles is quite clearly observed since the time of «colonization» of the eastern Eurasian steppe: on walls of vans and graves of the preceding period. Leather piece of the Petrovka chariot tire of red color was found in the Satan burial ground; a numerous series of decorated chariots is shown in the Chinese materials. As it was already noted, this tradition reached its flourishing in the painting of the Qing Dynasty chariots.

Fragments of colored textiles from Petrovka and Alakul' monuments of red and reddish-brown colors correspond to main colors of women's clothing on the Tarim mummies in Xinjiang.

Sufficiently discussed in the literature was the red as a symbol color in ancient societies, where it was apparently associated with fire and in a single semantic range with the yellow (golden) signifying the sun, the blue for the sky, symbolized the basic elements of the cosmogony of pastoralists [Akishev, 1984 , p. 133]. Here I'd only note that in China, in ethnographic time, there were a strict ban and a death penalty for using the red in routine life as it is a prerogative (insignia) of the emperor.

Mineral colors, mainly, ocher of red-brown and yellowish colors were widely used in the Bronze Age in all steppe regions of Eurasia. For example, analyzes of chemical compositions (>60 samples) from different monuments of the Northern Caucasus and Kalmykia showed the existence of trade relations with some regions, too remote for Kalmykia – with the North Caucasus, Mangyshlak, and the Don river basin. At that, red paints are dominant, consisting of ocher (iron hydroxides) with admixture of only 10% of toxic mineral cinnabar [Alexander, Alexander, Shishlina, 2000a. 108-114].

As shown by analyses of red dye clothes from Pazyryk graves in the Mountainous Altai of 4th-3th cc. BC, the paint was imported from areas of the Eastern Mediterranean, although there are more than 60 plant species in the Altai which could be used as source for making the paint. Vegetable madder root dyes of Rubia tinctorum L. and animal dyes from carmine bearing insects of the kinds Porphyrophora or of Kermes K. vermilio could be the objects of the import. Madder also grows in Europe, Iran, India, China and Central Asia [Polosmak, Kundo, 2005, p. 590-591, 2006].

Dyeing technology is a rather complex process of either prolonged boiling or a «cold method»: under the sun, in special pits for fermentation of the dye stuff. Serious knowledge of the chemical processes was needed for successful coloring of wool [Usmanova, 2010, p. 102-104]. In the author's opinion, dyes derived from local plants could be in use, but, obviously, the most stable and vibrant colors were rendered by imported ones.

Seeds of cultivated plants. Judging by numerous finds of little seed bags on the Tarim mummies' belts in some graves of the Great Steppe zone, they could be an important object of trade exchanges. Thus, during excavations of the Arzhan 2 burial complex in Tuva, dated to first half of 6th c.BC, fruits and seeds of plants were discovered in the main burial, most of which are imported, including coriander, which is spread in the Middle East, mahaleb from the Western Tien Shan, dwarf cherries from North-Western Kazakhstan, nut grass (Cyperus rotundus) from southern regions of Kazakhstan [Chugunov, 2011, p. 180; Neef, 2010, s. 242-249].

Thus, a global communications network, a system of global division of labor, was identidied; it allowed a more objective and multidimensional assessment of interactions of the «world of the steppes» with ancient civilizations. The identified external communication channels of the steppe societies are still unevenly documented, which is due to varying degrees of archaeological knowledge on this vast territory. The nature and characteristics of the process of ethnogenesis and cultural genesis in these contact zones are yet to be studied, to determine the nature of the interaction between the arriving and the aboriginal population, to understand the mechanism of the advancement: was it one-stage abrupt migration, or a gradual infiltration of «outsiders» into an agricultural community.

Processes of gradual change in the population's racial type, linguistic and cultural assimilation, formation of new passionary ethnics – all these deserve a separate study. Further I'd like to indicate the largest and most substantiated communication channels of steppe peoples, recorded by modern archaeological data and written sources (Fig. 177).

Turan communication channel

Currently available fragmentary archaeological materials do not permit to trace reliably the paths of advancement of steppe tribes in the southern agricultural regions of Central Asia, or from these areas to north.

Findings of molded ceramics of the steppe type and metal products made of tin bronze in settlements of settled farmers suggest the presence of an active channel of communication through the Ferghana Valley, the Caspian and the Aral Sea areas. Less documented by archaeological materials is the migration further south towards Pakistan and India, where this route is fixed by numerous petroglyphs along the Karakorum Highway [Jettmar 1980, 1983; Dani 1983].

The Tazabagiab culture, 19th-17th BC (Karnab-Sinkonchi) is located in the Aral Sea region [Tolstov, 1948, p. 67, 1962,

p. 47-60, Itina, 1977]. Monuments of the lower reaches of Zarafshan are considered as a variant of the Tazabagiab culture, a main component of which became the post-Pit's monuments of the Zamanbaba group [Gulyamov et al, 1966; Kuzmina, 1958; Itina, 1977, p. 232]. Further development of the Tazabagiab culture is associated with contacts between the local Suyargan culture and ecdemic Timber-Grave-Andronovo population [Tolstov, 1962, p. 57, 59, Itina, 1977, p. 139-140, 176].

In the Shortugay settlement of northern Afghanistan, a layer with Harappan materials is overlapped by graves of the Bishkent culture with molded dishes of the steppe type [Francfort, 1989, p. 211-223; pl. XXV-7 et seq.]. The materials of the settlements include: a «leaf-shape» bronze knife, awls and pins with tops, as well as a clay camel figurine, similar to that of the Pirak settlement in Northern Pakistan [Jarrige, Santoni, 1979, p. 177-179, fig. 94-95].

Or, for example, in Central Kazakhstan, in the Kent and Myrzhik Late Bronze Age settlements, a main stratigraphic layer contains dishes of the Sargara-Alekseevo-type with molded roller, constituting the vast majority, the Begazy pottery and dishes of the southern agricultural origin, made on a potter's wheel [Varfolomeev , 1988, p. 80-99, 1991, p. 16]. Molded ceramic with a roller appears in the cultural layer of Namazga VI (11-9 centuries BC) in South Turkmenian settlements, which over the period are reduced in size, or abandoned [Kuzmina, Winogradova, 1983].

Natives of ***the Bishkent culture***, according to A.M. Mandelstam, were pastoralists who came from north-west. This culture is genetically close to the Andronovo [Mandelstam, 1968, p. 131-141]. E.E. Kuzmina attributed the Bishkent (Vakhsh) culture as Indo-Aryan, emphasizing its connection with North India. Main sources of this culture are Zamanbaba and Andronovo [Kuzmina, 1974, p. 188-193].

Findings from the Sarazm settlement are similar to materials of the synchronous monuments of Southern Turkmenistan, north-eastern Iran and Baluchistan. A zoomorphic vessel from Sarazm, already mentioned above, contains an image of a human face, similar to Sintashta Petrovka and the Shang-Yin statuettes. According to the chronology of Sarazm, grounded by R. Bezenval, dating of the monument is defined between the second half of 4th – second half of 3rd millennia BC. The vessel with zoomorphic decoration, according to this chronology, dates back to Eneolith. At this time, western ties of Sarazm with other regions of the Middle East were fixed, and gray clay ceramics of Kelteminar appearance suggest contacts with northern, steppe regions. The above analogy in fine plastics is in favor of northern connections [Skoda, 1992, p. 57-59; Besenval, Isakov, 1989, p. 5-20, see Appendix 3].

An eminent expert of Central Asian antiquities V.M. Masson attributes the beginning of spread of steppe complexes in the region to early 2nd millennium BC, when remains of domesticated horses begun appearing in local archaeological cultures, and this gradual migration continued throughout the 2nd millennium BC. The author, following I.M.Dyakonov, notes that «in the extreme south of the Central Asian region, natives of the steppe Bronze traditions reached the sedentary oases, where the civilization of the ancient orient appearance flourished, and penetrated an urban population environment. It was one of the cultural genesis types, a mutual cultural and, perhaps, ethnic assimilation».

He defines this migration not as an expansionist conquest and not as an amorphous «infiltration» of the steppe people,

but as an organized process of migration of small numbered groups. The author concludes: «Presumably, a structure of early complex societies, established in a nucleus of the steppe ecumene with the leading elite of the armed charioteers, contributed to the process» [Masson, 1999, p. 72-74].

I believe that this definition aptly describes all of the steppe communication channels and emerging contact zones of cultural interaction throughout the Euro-Asian contact zones.

N.M. Vinogradova also believes that infiltration of the Andronovo tribes to south was a relatively slow process, no destruction to farming settlements were traced. Contacts between nomads and farmers were peaceful in nature, conditioned by exchanges of agricultural products and crafts from the south for copper and tin from the north. Similar processes took place in southern Uzbekistan, on the Sapalli culture monuments, as manifested both in the burial practices and material culture. In the south of Tajikistan, the Andronovo tribes come into contact with farmers and with natives of the Bishkent-Vakhsh culture. The communications existed in the Andronovo time and lasted during the Karasuk time [Vinogradov, 2000, p. 105-106].

In general, this situation can be explained by the theory of L.Gray and T. Barrow on settlement of Indo-Aryans and proto-Iranians. According to them, initially Central Asia and Eastern Iran were gradually settled by proto-Indo-Arians. Subsequent migrations were associated with the outflow of surplus population to India. When the Iranians gained control of the territory, they had to meet here proto-Indo-Arian descendants and naturally were mixing with them during a long period of time [Burrow, 1973; see more – Litvinsky, 1981, 2000, p. 185-288].

Chinese communication channel

There were a lot of arguments from my side in its favor on these pages. Chinese chronicles and inscriptions on the divinatory bones clearly indicate the active contacts with the steppe peoples who were coming from north. I suppose that wangs of many states along the northern boundary of the Central Plain of China were the elders-leaders of steppe clans who migrated with their relatives outside of the steppe ecumene. In the future, this channel of communication becomes so powerful that with centralization of early Chinese state during the Qing and the Han periods required building the Great Wall of China, grand by the labor costs and lasting several centuries. Obviously, there was an early communication channel between the Harappa and northern regions of China. At least, somewhat later, this channel served the spread of Buddhism from India to China.

Balkan communication channel

Another system of external relationships developed between pastoralists and the Mycenaean civilization. Many researchers determined the time of penetration of the Indo-European tribes to Greece at 1900 BC, with end of the Early Helladic III – beginning of the Middle Helladic I periods, which agrees with the linguistic and archaeological data [Wyatt, 1970, p. 89].

Sudden changes in the material culture of ancient Greece are observed exactly during the 17-16 cc. BC, when a tradition forms to manufacture daggers, death masks, special burial structures, the shaft tombs, to depict chariots on their walls [Stubbing, 1963, p. 9; Nilsson, 1933, p. 72]. These innovations are usually associated with the Egyptian or Anatolian influences, and appearance of chariots here is explained by borrowing from the Hyksos and the Egyptians, with whom the Greeks contacted after 1570 BC. [Schachermeyer,

Fig.177. Map of communication channels in the 3 millennium BC: the era of battle wagons and vans.

Fig.177A. Map of communication channels in the 2nd millennium BC: the era of the chariots.

1951, s. 705-751]. But all these assumptions are contrary to the linguistic data, the inscriptions on the tablets from the palace of Knossos KN Sd0401-Sd0403 and to information from the Homer's Iliad [Ventris, Chadvick, 1956, p. 365-366].

Written sources mention two types of ancient Greek chariots: 1) «light two-horse chariots, bridles of which are equipped with carved horn bits (psaliis) and cheek straps» and 2) the four-wheeled vehicles pulled by mules [Iliad, 24, 266 – 275].

According to the linguistic analysis of the Greek terms associated with a vehicle, of the undoubted Indo-European origin are names of chariots themselves, wheels, axles, yokes, reins and horse headbands. Names of rein parts are either Indo-European loan translations of foreign terms, or own Greek notations of previously unknown items [Wyatt, 1970, p. 102]. Most likely, the Greek name for horse, «hippos» has an Indo-European origin; judging by the finds of remains of domesticated horses in Troy VI, from a layer dated to 19 century BC, and in Malthi, they evidence earlier contacts between pastoralists and the ancient Greeks [Frisk, 1960, s. 733-735].

Archaeological and linguistic materials of the Crete-Mycenaean culture also clearly indicate the presence of developed channels of communication with steppe groups. These contacts were energized during 19th-16th cc. BC. An obvious result of this relationship is adoption of the Mycenaean «traveling wave» and meanders by the steppe ornamental tradition: they became characteristic elements of the Alakul' and the Andronovo decorative pottery.

Iranian channel of communication

According to archaeological data, the Indo-Iranian community was to completely dissolve in the period of 17th -12th cc. BC [Kuzmina, 1994].

Wall paintings. Han Dynasty (206 BC. E. – 220 AD). The cart, drawn by shifts way of harnessing [Over 2200 year Unsolved ..., 2011, p. 95].

E.A. Grantovski [1970], based on the analysis of Iranian names in Asia Minor, established that Iranians appeared in the Iranian plateau by the end of 2nd millennium BC and became multiple only in 8th cc. BC.

A number of significant innovations emerge in the culture of Iran during this period. Thus, archaeologists discovered ancient cultures in Hasanlu, Dink-Tepe, Marlik, Babajan, alien to the Iranian horse burial ritual, while in Luristane and Sialk VI, the rite of burial of a horse harness; in arts, numerous images of riders, horses, and horse-griffins were found in Amlash, Luristan. In Sialk VI and Guiyan, bronze bits of Pre-Saka type were found [Kuzmina, 1994, p. 163-194].

R. Hirschmann first juxtaposed these innovations in culture, observed in Sialk, with migration of Indo-Iranians. This hypothesis is supported by the fact that these new features in the spiritual culture of Iran have a long tradition of development in the Eurasian steppes [Kuzmina, 1971, 1977, 1994; Pogrebova, 1977; Mallory, 1981]. Apparently, the ritual of burial and portrayal of horses and riders record the path of

Iranian-speaking tribes moving from the Eurasian steppes to the Iranian plateau and bringing with themselves the horse breeding skills and the horse cult.

According to the Near Eastern written sources, before the middle of the 2nd millennium BC, a group of Indo-Aryans penetrated to north of Mesopotamia and to the southern part of the Armenian highlands. They occupied a dominant position in the Mitanni state and the neighboring countries, which is documented by spread of Indo-Iranian titles of gods, as well as Indo-Iranian names, including those of the ruling dynasty and nobility. A king's title speaks on the role of horse chariots in the society, meaning literally «managing horses», and names of the rulers: one of the Tvishratha etymologies as «having racing chariots», Abirattash as «facing chariots», Vriddhashva as «possessing big horses» [Barrow, 1976, p. 30, see: Elizarenkova, 1989, p. 429.430]; an existence of a privileged class of warriors is indicated by the term «marianni», meaning the nobility and originating from the Indo-Iranian «mar» (man). [Kuzmina, 1994, p. 163-194].

Opinions of linguists diverge in the interpretation of ancient texts. Some believe that the Indo-Iranians lived in Anatolia in the 4th – 3rd millennia BC, and justify the similarity between the Sumerian and Indo-Iranian languages, for example, Sumerian si-si (horse) and Indo-Iranian asve – ek'uo, as well as borrowings by the Indo-European of some Semitic language fundamentals [Gamkrelidze, Ivanov, 1984]. Indo-Aryan glosses occur in the terminology related to the chariot and horses, in the guidelines of the groom Kikkuli, compiled for the Hittite kings.

Indo-Aryan gods Mithra, Varuna, Indra and Nasatya were called as guarantors of treaties between the Hittite king Sappilulium I and Mitannian prince Shattivaza, while Mitra, generally, acts as the god of unions in the texts [Mayrhofer, 1966]. According to the researchers, the arrival of Aryans to Mitanni occurred in the 16th-15th cc. BC, they were natives of a particular dialect of the Aryan [see Ghirshman, 1977, p. 20-32].

Other linguists [Dyakonov, 1989, p. 5-21; Kammenhuber, 1961] suggest that the Sumerian language phonetic system was very difficult, reminding the East Caucasian languages; a typology of the proto-Kartvelian word structure is strikingly similar to the proto-Indian; the Hurri-Urartian languages belong to the East Caucasian language family. Following the S.A. Starostin, I. Dyakonov acknowledges a link of the Caucasian languages with Ketta on the Yenisey river, as well as with the Sino-Tibetan. The Hurri-Urartian language is linked to the East Caucasian origin, and the Hittite to the West Caucasian.

An Aryan identity of the cuneiform text glosses of 2nd millennium BC, is challenged, which, according to the author, were given in a Hurri form; it is stated that the list of gods ensuring the Hittite-Mitanni treaty of peace is very long, and the Aryan gods are mentioned the last. It follows from the comparisons that «simply no room» was left to Indo-Europeans in the Near East.

However, a possibility of Indo-European presence in the Near East should not be excluded. Its forms could be different, to be specified by the archaeological data.

I think it is appropriate now to go back to antiquities of the Seima Turbino phenomenon, exactly, to the historical fate of its natives, who possessed an advanced bronze casting industry and a unique pictorial tradition, both of them based on use of tin bronze, sleeve-type casting skills and specific way of portraying horses. This phenomenon is directly associated with the Karasuk antiquities.

It seems that few Seima Turbino monuments were created by groups of blacksmiths, united by kinship and work duties, having a special caste social status, and incorporated into powerful, first of all, Post-Abashevo and Early Andronovo ethnic communities, and not vice versa, as stated by E.N. Chernykh and S. Kuzminykh. Sacred caste nature of the blacksmith's profession is known from ethnographic data about almost all nations of the world.

This assumption is confirmed by the Seima Turbino findings in the Petrovka-Sintashta [Zdanowicz, 1988, p. 138; Gening, Zdanowicz, Gening, 1992] and Pokrovka mounds in the Volga region [Bochkarev, 1986, p. 107-109]. The two-blade bronze knife with a flat handle of a Seima type was found in the Akmaya metallurgist settlement in Sary Arka [Kadyrbaev, Kurmankulov, 1992, p. 66, Fig. 34-1] and other Alakul' monuments (a spear of a Seima Turbino shape, a bronze vessel from Aschisu are new materials from I.A.Kukushkin), and the findings grow in number with each field season.

The heterogeneous ethnic and cultural composition of the Seima Turbino production groups are indirectly reflected by absence of territorial localization of the culture, a «motley» anthropological type of its natives [Dremov, 1984, p. 14-21] and difficulties in determining the actual Seima Turbino ceramic as such [Chernykh, Kuzminykh, 1989, p. 228-230, 240]. Here we are dealing with a case unique for the Soviet archeology when a mighty bronze casting and pictorial traditions were revealed, however with none fitting archaeological culture. That is why Mr. Parzinger called the Seima Turbino transcultural phenomenon as «an artificial formation» [Parzinger, 2000, p. 68].

It seems that existence of the transcontinental «Great Tin Road» is a key to the essence of ethnic and cultural processes in the Great Steppe also in the late second millennium BC, in general, and in the contact zones, in particular. It was this road, as the Silk Road later was, that became a channel of spread of not only copper ore and bronze production additives, but of new knowledge, through constant migrations of various tribes and obviously family groups of hereditary smiths, bearers of the production technology of the most modern weapons of the time and of secrets of sleeve-type bronze casting. Migration of the production groups as part of the Karasuk tribes moving from east to west is not excluded.

Thus, in the Developed Bronze age of settlements Atasu, Myrzhik, Ak-Mustafa, Akmaya in Central Kazakhstan, own center of bronze metallurgy was actively developing, which emerged here, apparently, under influence of an Early Alacul' impulse or of direct migration of the tribes to south. However, in the era of Middle Bronze age this center was in decline, the settlements were abandoned by blacksmiths to be later, at the turn of the first and second millennia BC, populated again by people specialized in cattle breeding. [Kadyrbaev, Kurmankulov, 1992, p. 148-149, 234-237]. Who, then, could produce the brilliant weapons in the Begazy-Dandybai period? One answer is sole: only those who had skills and owned great technological secrets, returning to native places of own ancestors.

An interesting situation is recorded in ancient cuneiform texts of the Assyrian and Babylonian kingdoms of 7th-6th cc. BC. In the Babylonian writing tradition, the term «Cimmerians» describes, as a rule, all known to the Babylonians the nomadic peoples and countries: Scythians, Sakasand, obviously, the Cimmerians themselves and their country Gumiraia. In Assyria of 7th century BC, this term was used as a self-naming of an independent people, along with the Central Asian Sakas

(Scythians). [Ivanchik, 2001, p. 16-20]. Given that the Assyrians were in direct contact with the steppe peoples and knew better than the Babylonians their steppe neighbors.

Cimmerians repeatedly undertook successful military raids on the ancient states of the Western Asia; their eventual «expulsion from Asia» is attributed to the Lydian king Aliatt in 8th century BC (714 BC). Cimmerians, in contrast to Sakas, have never been allies of the Assyrian kings, and significant period of time were a formidable military association. Because of such a military threat perhaps the Emperor Ichzhen had to have the Great Wall built.

Thus, a megalithic phenomenon of the Begazy-Dandybay culture in Kazakhstan, the deer stones tradition in Central Asia, considered as a result of serious ethnic and cultural processes in the Eurasian steppes in 2nd – early 1st millennia BC, directly associated with migrations of the Karasukoide type population, who owned the most advanced then skills of production perfect weapons, construction of megalithic structures, secrets of sleeve-type bronze casting and use of chariots. These were the descendants of those early «colonists» who in the 3rd millennium BC reached the Minusinsk Basin, «settled» there and in the foothills of the Altai Mountains for several generations. Perhaps, these tribes later was known as the Cimmerians and added many glorious pages in the annals of the history of the Ancient World.

Attempts to find remains of the Karasuks-Cimmerian material culture in the territories of the Asian Near East civilizations [Ivanchyk, 2001] are pre-doomed to failure because these people undertook mobile raids, campaigns solely for trophies, at «lightning» speed by an historical scale; dead warriors traditionally were burned, and at home, in Gumiraya, in memory of their heroic deeds unique cenotaphs were erected, numerous memorial complexes with deer stones.

Obviously, such interpretation of the Seima Turbino and Karasuk antiquities both in their development dynamics and in their relationship system with other communities means they are of the Indo-Aryan ethnic basis, which later became a ground for an emerging proto-turkic ethnicity somewhere in Ordos vast spaces (Gumiraya), while the Timber-Grave and Andronovo communities, and possibly of the Tazabagiab culture, provided an Indo-Iranian ethnic basis to the Scythian-Saka tribal community.

Anyhow, this assumption is confirmed by earlier identified differences in the portrayal manners and iconography of chariot petroglyphs of East Asia. Moreover, there are archaeological cultures bearers of which were familiar with some innovation technologies, carefully preserved and used them in everyday life, while other societies were not even acquainted with and did not use any of the above.

Conflict of interest between the two ethnic groups defined the relationship between the societies and significantly influenced the historical destiny and the ethnogenesis of many peoples living here. External communication channels created by the two groups dictated particularities of the interaction between nomads and of almost all settled civilizations of Eurasia in this wonderful and unjustly forgotten era of chariots. ■

As a whole, according to the above linguistic and archaeological data, communication channels in the steppe Eurasia directed to west, east, and south. The transcontinental transport corridor identified in the previous historical period, and direction of communications remained and actively developed in the era of the chariots.

Study of the communications history discovers some amazing mysteries of the genesis of many great ancient civilizations and somehow affects the stereotypes. A separate study of ancient technologies and innovations, conservative rituals and traditions can fill in many gaps in the knowledge of the Ancient World, occurring from natural flaws of the sources used in our studies, and remove many controversial issues, such as, what comes first, a cavalry or a chariot.

Evidently, some inventions could cardinally change daily lives of ancient societies, and at times determined by the historical content of entire eras, grounding the communication channels of these societies and being dressed in a «miraculous» clothing, helped creating masterpieces of the ancient world architecture, shape ethnic identity of a society, regulate the social, moral and ethical settings of ancient communities.

Such communication was especially important in a mobile society, ways of life in which did not allow to have time for centuries-old records, chronicles and annals, possessing only verbal, or sign-image, and, perhaps, musical channels of communication; where no governmental or social institutions of bureaucratic impact on a society took place.

Very often, this feature is wrongly equated with savagery or barbarism, as opposed to a main indicator of a farming civilization, the writing. In reality, it is another form of a single channel of communication, which is dominated not by encoding process and its form, but by the «message» itself, the information which the ancients were concerned to give. Our inability to correctly decode their message does not mean the primitive or fantastic nature of the message. On the contrary, it is, as a rule, a highest form of abstraction, creative thinking and artistic synthesis, originating from a completely different way of mobile, nomadic life and corresponding perception of reality. Consistent with our views, we try to «decode» the message and apply an entirely «alien», fundamentally unacceptable key.

Difference in mentality and perception of a farmer and a pastoralist, of an ancient man and a contemporary scholar creates incredible noise and hindrance, which disturb deciphering the «message», let alone reconstructing an expected message response. The situation can cardinally be changed only by comprehensive study of both material and also spiritual world of early pastoralists, reconstructing ancient technologies, traditions and rituals in order to extract objective information.

Subsequent periods in the history of Eurasian steppe communications show a striking repetition of cycles and formation of standard communication channels based on «wonderful» inventions: success in domestication of horses, improvement of bridles and the horse harness brought to the forefront of world history a rider on horseback or on camelback, which has become a symbol of the epoch of early nomads. Again, we see a repetition of routes and directions of communications channels, leading to a fall of the Western Roman Empire and to Great Resettlement of peoples.

Paths, established once by ancient pastoralists, were used in later historical periods, up to the ethnographic present, because they are oriented on affordable natural and ecological conditions of such movement. There is no reason to think that it was

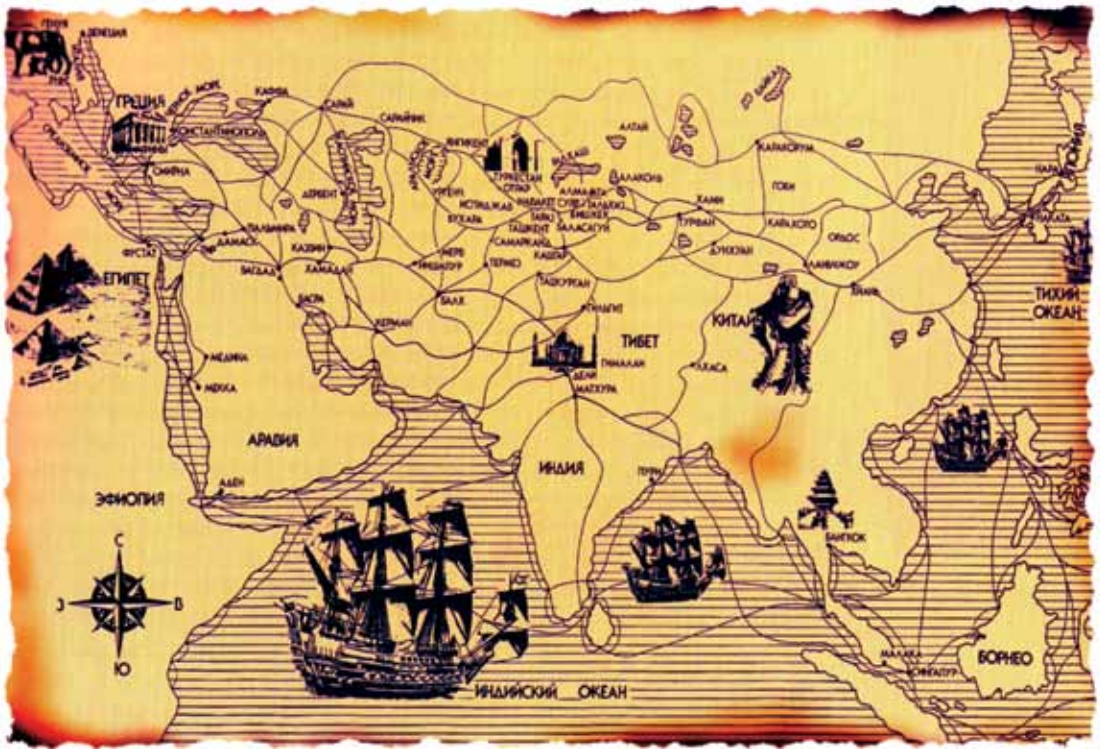


Fig. 178. Map of the Great Silk Road. [Baipakov, 2007, p. 37].

a one-way motion: rather, it was of a cyclical or recurrent nature, which also comes from the deep foundations of the pastoralist economy.

Some researchers of the Silk Road history (Fig. 178) suggest its emergence thanks to early trade contacts exchanging tin, copper ore, horses, etc., dating back to 3rd-2nd millennia BC, [Baipakov, 2007, p. 14, Kuzmina, 2010], and they relate the beginning of its functioning as a traffic artery with some probability to mid-1st millennium BC, when the large-scale supplies of lapis lazuli were recorded for the first time as delivered from the Badakhshan mountainous deposits and of jade from the upper reaches of the river Yarkendari (Khotan) to China, Iran, Mesopotamia, Egypt and Syria.

Along with lapis lazuli and jade communication channels, starting from 6th-5th cc. BC is the development of a so-called «steppe road», which, in fact, was already serving silk export from China. The existence of this way is solidly documented by finds of Chinese silk in the Pazyryk barrows and other synchronous monuments. The steppe path began at the great bend of the Yellow River, crossed the eastern and northern spurs of the Altai, steppes of Kazakhstan and the Black Sea region, reaching lands of the Greeks and the Etruscans. At the same time, the silk – «sinapatto» – penetrated India, as evidenced by written records [Baipakov, 2007, p. 14-15, 111-124].

Along with «the Lapis lazuli road» and «the Jade road», very early «an Amber road» was formed, an eastern branch of which ran from the Baltic Sea cost, along the Vistula River, and across the Kiev Rus' territory, reached the Black Sea, where it joined the ancient caravan roads linking Europe to the Middle East, Western and East Asia.

Apart from the «steppe road», a «Western Meridian route» functioned, connecting Central Asia and Southern Siberia with south-west regions of contemporary China. Long-term excavations of monuments on this route revealed the Dyan culture of 4th-2nd cc. BC. Elite burials of this type are associated with the Dian state, located in the Yangtze riverhead, demonstrating a rich set of things performed in the «animal style» characteristic to the steppe. Materials of the burial grounds in Shichzhashan and Taybayshan evidence well-developed and actively functioning system of communication channels between «the steppe world» and the early Chinese states [Baipakov, 2007, p. 114-115].

However, researchers traditionally relate the start of functioning of the Great Silk Road as a global transcontinental artery only to 138 BC, when a thirteen-year diplomatic tour of Prince Zhang Jian, sent by Han Emperor Wu Di, took place for a survey of the unknown north and west lands. ■

«Journey of Van Chzhaotszyun to the North» by Chew Yin: in 35 BC Chinese emperor Yuandi (Western Han) blessed dynastic marriage to the beautiful Van Chzhaotszyun with ruler of the Huns – Huhanse, which ensured peace with the warlike Huns for 40 years, and safe passage for trade caravans with silk through the northern territory [China: History and Civilization, 2007, p.58].

Chapter 5

The «Message»: Communication with Gods

«Miraculous vehicle»

A vehicle and, especially, a chariot, as an aggregate of the most advanced achievements of ancient societies, were perceived by ethnic groups unfamiliar with the invention as a «miracle», it seemed to manifest divine and supernatural forces. Therefore, the chariot was «naturally» deified within primitive mythological conceptions of steppe (and other) societies, becoming an important element of the systems, a main attribute of supreme gods of any pantheon in the ancient world, providing a link between the world of mortals and the world of gods.

The image of the chariot was in extreme need by chiefs, elders, priests for building up internal communications within own society for most effective impact on its production potential, resource mobilization and implementation of major projects of the cult construction, according to mythological views of priests and a variety of «irrational», in terms of modernity, whims of rulers and tyrants.

In due time, J. A. Sher, analyzing the chariot scenes of Saimaly-Tash, singled out a group of «miraculous» chariots pulled by a pair of animals of different species and compared them with numerous written and visual texts of Eurasia [1980, p. 281-287]. Indeed, the ancient Vedic and Indo-Iranian mythologies contain many stories with participation of supreme god chariots pulled by a variety of fantastic creatures.

In the petroglyphs of Eastern Kazakhstan (Moinak, Fig. 179), Z.S. Samashev [Samashev, 1992, p. 131, pl. 92] found a composition of two harnessed goats, another with goats being in the process of harnessing by a man; near are two circles connected by a line, figures of two dogs and two ibexes. To decipher the subject, the author turns to the Vedic mythology and compares an ibex with an image of Pushan, in particular, whose the most important attribute is a chariot drawn by goats; the god is given a goat as his sacrificial share in rituals.

Close relationship of Pushan with a goat image is emphasized by its hairyness, its disheveled hair. All these features make him close to the Lithuanian Perkūnas, the German and Scandinavian Thor, the ancient Greek Pan, the Slavic Perun, images of which stem from the common Indo-European roots.

Pushan is a patron of the path connecting two points in the space: the sky and the earth (top and bottom), and it was originally born in the sky (in heights), the second time in the ground (in depths), a goad is one of his attributes [PB, VI, 58 , 2].

In Vedic cosmology, heaven and earth are indicated as two wheels on opposite ends of an axle [Toporov, 1964, p. 107]; possibly two dumbbell-shaped signs from Moinak represent the top and the bottom of the mythological space, between which is the way of Pushan on a chariot drawn

Fig. 179. Kazakhstan. Tarbagatai. Moinak. «Magical chariot» [Samashev, 1992, fig.92].

by two goats [Ogibenin, 1968, p. 70-76]. Two figures of mountain goats (one upside down) in the composition can be interpreted as an attribute and a sacrificial share of Pushan, and a horse (a dog?) as a sacrifice to the sun god [Samashev, 2010].

Yu. Mikhailov, analyzing the subject, suggests that the fact of placing a human before the team is of fundamental importance, because it is stated in the text «Younger Edda» that the place of judgement is attended by the gods on horseback, and only Thor, the enemy of the world serpent and the owner of the miraculous vehicle, drawn by goats, comes on foot [2002, p. 57]. Some of iconographic (and semantic) parallels of the «miraculous» team find unambiguous analogies in the Chinese mythology [Yevsyukov, Komisarov, 1994, p. 93-94, 1995].

We have already cited the «miraculous» goat team in the Shang burial ground Gotszyachzhuan. This finding clearly confirms authenticity of the subjects' decryption, which, respectively, significantly narrows the range of search among many mythological stories and samples of ritual (magical) practices of ancient steppe societies.

Pictorial series

Important matches brtween iconography and semantics of main characters of the Central Asian pictorial traditions were found in the culture of Tripoli-Cucuteni and its derivative steppe cultures (Fig. 180-181).

Thus, limestone slabs with images of animals and humans were found in the Usatovski I burial ground, in mounds 3 and 11. Two of them were among stones of southeastern part of the cromlech of the burial ground 3. The smalleer slab had two bowl-shaped cavities and relief images of horses on a reverse side facing the ground. The second slab had engraved figures of human, a deer and relief horses (Fig. 181:23) [Patokova, 1957, 1979].

As in the Kernosov idol, combination of anthropomorphic figures with fingers spread apart and several horses were observed on a grave slab at the station Novosvobodnaya. Images of deers similar to Usatovo ones, are widely represented in the petroglyphs of Mongolia of the Chalcolithic period.

The Usatovo anthropomorphic character is shown either in a mask (?) or with a painted face (?) and is made in an original bi-triangular style, characteristic to images of a human on the Tripoli ceramics (Fig. 181). It is interesting that the dress (?) hem is decorated with tassels, same as on sleeves of Karakol figures of the Altai. The anthropomorphic images, painted or carved on the Tripoli ceramics, have their fingers spread wide apart (Zhukavets, Luka-Vrublevetska, Tyrpeshti III and others) as those images of people in Mongolia, Xinjiang and the Caucasus.

Earlier, «a pictorial series» of vehicles and chariots was revealed in the whole array of visual sources, based on statistical data: vehicle> bull> mountain goat (deer)> dog> man (solar symbols); for chariots: chariot> horse> mountain goat (deer)> dog (wolf)> people (foot – hand – solar sign).

A combination of a chariot with predominantly a deer is characteric to the Mongolian pictorial tradition. Further we will examine images compiling the series and their possible «decryption» with no further analysis of the vehicle-chariot image, intermediate interpretation of which is quite clear and universal.

Charioteer, driver (foot, hand, solar symbols)

A series of images under consideration was identified from the general mass of similar shapes by two indicators: radiating heads («sun-headed» anthropomorphic creatures) and fingers intentionally spread apart.

The earliest images of vehicles in Southern Siberia are: a van drawn by a bull team on the Znamenskaya stele and a cart from the station Ust-Byur both side by side with images of mask (Fig. 84; 85:1). «Sun-headed» drivers of gigs and carts, similar to images on the Harappan pottery are present in the petroglyphs of Saimaly-Tash and now on rocks of the Eshkiolmes gorge in Southern Kazakhstan.

«Sun-headed» charioteers run chariots in paintings of Indian grottos. The combination of two ancient characters – a chariot and a «sun-headed» anthropomorphic being – cannot be accidental, and apparently indicates their mythological proximity, if not identity (Fig. 91).

The distinctive, easily recognizable iconography of the «sun-headed» anthropomorphic creatures in the Asian pictorial tradition may originate from a head dress or a mask of bird feathers.

A headdress of a similar type is known with Indians of North America and some African peoples; it is most clearly visible in Karakol images. The birdhead-shaped mask was engraved with an anthropomorphic figure on a slab of the Tas-Haza burial ground.

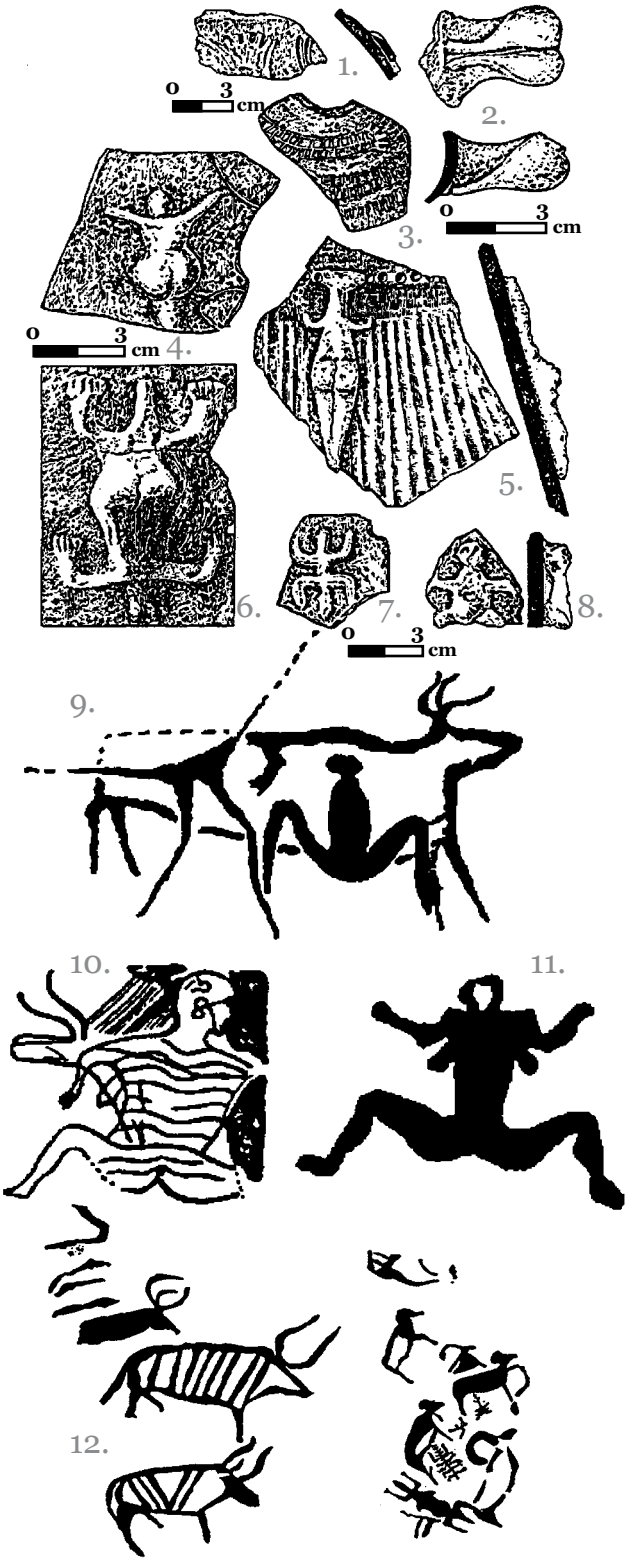


Fig. 180. Images of the Mother of the progenitor. 1, 2 – Izvoare I; 3 – Floresti II; 4 – Traian Dyalul Fyntynilor-II; 5, 8 – Byrleleshti; 6-7 – Trusheshti I; 9 – Ust-Tuba III; 10 – Chernovaya VIII; 11 – Syda; 12 – petroglyphs in the valley of Chuluut river. [Eneolithic of USSR. Table LXXIV; Sher, 1980, fig. 125; Novgorodova, 1984].

Fig. 181. Images of people and animals in the art of the steppe and the Tripoli-Kukuteni societies. 1, 2, 6-8 – Kostesti IV; 3-5, 9 – Brynzeny III; 10-13 – paintings on the mat, found in the tomb11, barrow 3, Baturynsky II; 14-15 – Rzhyshchiv; 17 – Koshilovtsy-Oboz; 18 – Belteni; 19 – Golden-Bilche Verteba; 16, 21, 22 – Traian Dyalul Fyntynilor-III; 20 – Geleeshti; 23 – Usatovo, barrow I; 24, 26, 27 – Tyrpeshti III; 25 – Luka-Vrublevetskaya; 28 – Zhukovtsy; 29-30 – Veremie; 31 – Grebeny. [Sharafutdinova, 1983; Eneolithic of USSR. Table. LXI].

A religious role of birds is recorded in the burial ground 21, Chernovaya VIII, where a skull of Demoiselle Crane was found together with sacred subjects. The cult of birds grew rapidly in China during the Early Dynasties: there are birds' figurines in huge burial pits.

A headdress with radiating spikes was found in the tombs of noble women of Ur [Bray, Trump, 1990, photo 104]. Sometimes anthropomorphic figures have hat-masks conical in shape, but always ending with small spikes (Tas-Haza, Chuluut) [Leont'ev, 1978, p. 88-118; Novgorodova, 1989, p. 96]. They are absolutely comparable with the headdress of Saka «prince» from the Issyk burial mound [Akishev, 1978].

Another sign typical to anthropomorphic figures is deliberately spread fingers (Kernosov idol) or explicitly shown two-three fingers on their hands (Chuluut, Tas-Haza, Karakol, Novosvobodnaya). I should also mention another feature of the Karakol figures: a «tail» and a bow. Later in the Bronze Age, the feature becomes definitive of male figures in petroglyphs throughout Middle and Central Asia [Kubarev, 1987, p. 150-170, 1988].

Drawings were found in East Kazakhstan [Samashev, 1992] and in the Chinese province of Yunnan, strikingly similar to that of Karakol. Here, in the Kanguan town, on an exposed rock, multiple figures were painted with red paint: signs, animals and «sun-headed» creatures [Chen Zhao-fu, 1988, p. 100-101, pl. 64-69 et seq.]. Similar figures were found among petroglyphs of Xinjiang, the Altai, Tuva, on ceramics of the Samus' IV settlement and in petroglyphs of the Angara river valley in the taiga zone.

The south group of analogies is represented by findings in steppes of Kazakhstan: in the Baikonur river valley, in the sanctuary of Tamgaly, and in Saimaly-Tash in Kyrgyzstan. A certain canonization is observed when a character's head is reminiscent of a child's drawing of sun. And finally, similar images were found among grotto paintings of India and on ceramics of the Harappan civilization [Brooks, Wakankar, 1976, p. 32].

Faces are associated with the «sun-headed» character and are its part, according to the principle of pars pro toto, or represent an image of a headdress mask itself. It is illustrated by similarity between the Karakol figures and some of the early Afanasievo (Okunev) sculptures; at the same time, images of faces changed in styles significantly in the Okunev time and later on. Petroglyphs of Mugur-Sargol in Tuva can give an idea of this stylization in the Bronze Age [Devlet, 1980, p. 226, fig.].

The Vedic tradition: Mitra (Varuna) and Indra

The Rig Veda mentions several gods of the Solar dynasty: Pushan was already mentioned above; Mithra alone was dedicated a whole hymn [RV, III, 59]; Indra is mentioned as Thunderer.

Twins Ashvins, «grandchildren of the sky», are closely connected to the sun god Surya and the solar chariot. Their chariot is drawn by horses or birds (eagles), or horses looking as eagles. In the Indian iconography, two Ashwins are located on sides of the solar deity in the form of a horse head on a rod [Litvinsky, 2000, p. 285-286].

Mitra is most often paired with Varuna, which appears as a single entity (a cult of twins?). Mitra (alone or with Varuna) fills the air, «holds the heavens and the earth» [RS, III, 59, 1], strengthens the sky and the sun, causes the sunrise [RV, IV, 13, 2]. Sun (Surya) is the eye of Mitra and Varuna [RV, I, 50, 6]. Essential attributes of links with sun are motifs of heavenly rides, horses, the chariot [RV, I, 122, 15], the golden throne [RV, I, 139, 2]. Mitra and Varuna together

watch the alternations of day and night; days belong to Mitra, nights to Varuna. Mitra is always identified with sun. A more clear opposition of colors is given in the Rig Veda [RV, I, 115, 5], where sun attributes «shining» and «black» are distributed respectively between Mitra and Varuna.

In the social space, the main function of Mitra is to bring people together [PB, III, 59, 1, 5]. Mitra appears here as the god of friendship that unites people in a particular social structure and establishes a contract with them.

The contract corresponds to the universal cosmic law Rita (rta) and the movement of sun. Mitra is tied to the land of people, to a solid ground; he always accompanies the alive and has, in contrast to Varuna, no ties with the kingdom of Yama [RV X, 14, 7].

Another god of the Solar dynasty is Indra. His exploits are associated with the cosmogonic act of creation of all things in existence: the victory over the serpent-dragon Vritra symbolizes the change of seasons, a «victory» of spring over the annoying cold winter and the pores of renewals. It is image often personifies the sun, it creates a new world order: «...thanks to its grandeur he put the sky on his head ...» [RV, II. 17. 2].

In general, the plot runs through the Indo-Aryan mythology, where the victory of the god Indra the Thunderer over the giant serpentine monster Vritra, the product of the moisture goddess Danu, and release of life-giving water and fire, as well as of stolen light in the image of a goddess of the dawn Ushas (which then as a brown cow was fertilized by a bull of Indra himself) is perceived as a cosmogonic act of overcoming the chaos and creation of the land and the world order in the universe [RV. III, 30. 14; IV, 19, 3]. After the collapse of the Indo-European unity, archaic ideas about the role and image of a snake survived with Indo-Iranian, Indo-Aryan, Turko-Mongol peoples and later transforms into a dragon image, a popular and iconic character. In Chuluuta petroglyphs, below a chariot and a charioteer shown is the snake (6.3.Su7, Fig. 182). Probably, this is Indra killing the serpent Vritra. Later in the mythology, this story was canonized as, for example, St. George slaying the dragon.

Avestan tradition – Veretragna and Mitra

Ancient Iranians imagined movement of the sun across the sky in the form of a glittering carriage, harnessed with heavenly horses. «The shining sun, immortal, rich, in possession of the fastest horses, are in our honor» [Litvinsky, 2000, p. 285].

In the Avesta, Veretragna is the god of war and victory, his name Vritrahan corresponds to the Vedic epithet of Indra as «a killer of snake-dragon Vritra». The Yasht XIV describes the conversion of Veretragna in wind, a bull, a horse, a camel, a boar, a hawk, a sheep, a goat and, finally, a beautiful warrior. This god is associated with Mithra in the Avestan tradition.

It is noteworthy that Farn, the symbol of royal power, was represented as incarnations of Veretragna in images of a falcon and a ram (an ibex, a gazelle), but his main incarnation was a white horse with golden ears and a golden bridle [Yasht, 14,1,9]. Farn in the Avestan tradition goes back to the sunny shining principle and the divine fire. (In the Vedic tradition, it is the light, shine, sun). Farn is connected with matrimonial and funeral rites, often transformed into a zoomorphic images. So, Farn flew off Yima as a falcon-varegna [Avesta, XIX. 32].

A solar deity in the Indo-Iranian mythology is personified in the image of Mithra, acting as an organizer of the natural and social order. A solar function of Mithra is expressed in such epithets as «brilliant», «bright» [Avesta, X, 44], with a face beam-

ing «like a Tshitriya-star» [Avesta, X, 143], «sleepless, vigilant», always awake as the sun [Avesta, X, 7], guarding the «Mazda's creation, the vigilant» [Avesta, X, 103].

The motif of close relation between Mithra and the sun in time is permeating through the Avesta: Mithra anticipates the sunrise [Avesta, X, 13] and «embraces the land upon the sunset» [Avesta, X, 95]. Indispensable attributes of Mithra are horses and chariots: «he steers a chariot with high wheels» [Avesta, XVII, 67] «and racers of heaven, glittering, light, shining, white, in whom there is no shadow, involve the chariot across a space of heaven» [Avesta, XVII, 68].

Fire approaching the variety of gods, of course, is «mithraical» in his services rendered to humanity [Dumezil, 1986, p. 55-56].

The emphasized feature of a two-three-finger palm of «sun-headed» characters in petroglyphs also finds a match in the Indo-Iranian mythology.

There are tales on a female deity preserved in the Nart epic, whose arm to the elbow is silver, spread apart and emits light. One could meet the woman only if climbes high in the mountains [Dumezil, 1990, p. 117-130]. The analogy with the Avestan goddess Astarte (Ardvi-sura) is quite obvious, worship rituals of which in the hymns are prescribed to be conducted in the mountains or at the waterfront.

The combination of chariots with human foot, recorded in Tamgaly petroglyphs (Fig.183), attributes an origin of the pictorial series to a very stable and ancient tradition, spread in various parts of the continent, to carve or engrave traces of a human or an animal. A foot image made with red ocher and found in the Catacomb culture burials is qualified as a cult phenomenon [Sanzharov, 1989, p. 97-107]; such images were found in petroglyphs of Karelia, the Urals and Siberia, the Caucasus, in the northern Black Sea region.

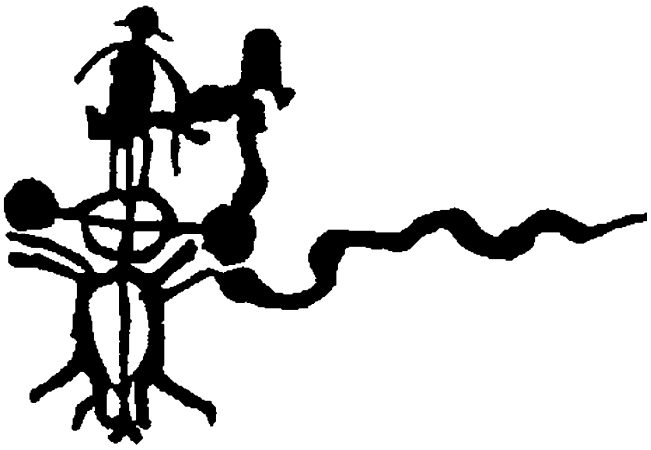


Fig. 182. Mongolia. «Snake-fighter» from Chuluut [Novgorodova, 1984].

In Scandinavia, numerous foot images are dated to 1400-750 BC by numerous accompanying images of various battle axes and daggers [Formozov, 1965, p. 130-139]. A stable survival of the tradition remained in various modern oriental religious systems: the Hindus worship stones with traces of Vishnu; Buddhists the Buddha's footsteps; Muslims revere the Muhammad's trace «Kadam sheriff» on a rock at the Jerusalem mosque and search for such traces elsewhere [Samashev , 2010].

The Avesta and the Rig Veda hymns narrate on gods of the Solar dynasty, marching across the sky and leaving there own footprints as a symbol of own presence. Herodotus in his «History» describes «an imprint of a foot of Hercules» on the Dniester [Herodotus, IV, 82]. Thus, images of footprints, obviously, mark a fact of presence of the Solar dynasty deity and traveling ways between different mythological worlds and also within the space of mythology.

Bulls. The image of a bull is one of the oldest and most popular in petroglyphs of Eurasia. Apart from their use as draught animals in vehicles, they are also common

Fig. 183. Kazakhstan. Chu-Ili mountains. Tamgaly. The chariot and foot of man [Rogozhinskiy, 2002].

in fight scenes, known, for example, by frescoes of the Knossos Palace [Sher, 1992, p. 35-37].

In one ancient mythologem of the Vedic tradition, the bull represents the sky, and a woman, the giver of life, the earth. «They are spouses: Father Sky and Mother Earth. The rain, emitted by the Heaven on the Earth ... is the seed from which all life is born ...» Deification of Father Sky and Mother Earth, from whom there is everything in the universe, refers to the period of the Indo-European unity [Sher, 1980, p. 276]. In the sacrificial animal hierarchy, existent in the mythology of the ancient Indo-Europeans (the Vedic tradition), the second place, after the horse, is oocupied by the bull.

Horses. Mythopoetical formulae «horses at a sacrificial pillar (the world tree)», «owning horses», «mistress of horses» or «a hostess/host of the two- and the four-legged», «owning fast horses», «lady of prosperous horses» refer to the languages of Indo-European peoples of the Unity period [Kuzmina, 2000, p. 3-9]. The subject of «horses at the world tree» is reflected in a composition consisting of a pair of horses or other animals on both sides of the world tree which sometimes is symbolized by an image of a human.

The subject is popular with petroglyphs of Central Asia and the Middle East. In one case, the subject was recorded in combination with a chariot image on a slab of the Karasuk burial ground Severny Bereg (the North bank) of the river Varcha I; this combination is frequent in the Middle Asian glyptics.

The image of a deity, the lord of horses, could emerge in times of first success in horse domestication as evidence of another «miracle». Twin brothers Ashvins-Dioscurs are semantically close to a class of mythological characters, one of epithets of whom is Nasatia, i.e. «big-nosed». Charioteers often were depicted in petroglyphs with an emphatic «prominent» nose. Many Chinese masks and figurines have the same attribute [see Fig. 157V, 162, Appendix 3, Fig. 40].

Indirectly, we can assume images of phalluses as a base for such comparison: the mythical Ashvins and Pushan are associated with incest, the idea of fertility; they embodied the wild sexual forces. Later reminescents of the images were preserved

in archaic vase painting of Beotia and Crete. Then, when the Balkan, Iranian and Aryan branches of the ancient Indo-Europeans began to disperse across the steppes and mountain valleys of Eurasia, each of them kept with themselves the images of once common deities. Over time, they changed, but the overall formulaic composition structure was «conserved» for centuries and millennia by ritual iconography, persisting for a long time [Samashev, Sher, 1987, p. 121].

It is established that horse sacrifices at the world tree has an Indo-European origin [Ivanov, 1974, p. 92, 110; Kuzmina, 1977] and is fully expressed in the ritual of asvamedha. The sacrificial pillar in the Rig Veda is equally close to an original ritual of sacrifice and to an image of the world tree, through which the spirit of sacrifice ascends to the appropriate deity. One of the names of the pillar – «asvattha» – is translated as «the pillar, to which the sacrifice horse is tied» [Ivanov, 1974; Sher, 1980, p. 267].

Mountain goats (deers). A goat is given a significant role to play as a sacrificial animal in a variety of religious and mythological systems; in the Indo-European mythological tradition, it appears as an attribute of Thunderer. There was an ancient Indo-European ritual of dismemberment and laceration of a sacrificed goat [Axe, 1983, p. 227-284]. This ceremony was so important that survived up to the present with many Central Asian peoples in various forms, in particular, as the kokpar game of Kazakhs.

The goat sacrifice is replacement of human sacrifices, dedicated to the main event, the New Year, when cult priests wore masks and goat skins. Dismemberment of a human body, an equivalent of a vertically organized structure of the mythological cosmos and a society is an act of cosmogonic order. A bright example is the ritual of purushamedha, the sacrifice of Purusha, in the ancient Indian mythology, the dismembered body of which is a source for elements of space and all the natural phenomena [Frank-Kamenetsky, 1938, p. 458-476].

Images of goats, camels and deers can be interpreted as preliminary or accompanying the horse sacrifices. In particular, the goat in the ashvamedha ritual appears as a sacrificial share of Pushan (closely tied to a goat image, being son of Ashwins), an intermediary god between heaven and earth, it is him, Pushan, who leads the sacrificial horse to a place of sacrifice [Samashev, 2010]. Mediatory function of the images of a mountain goat and a deer is identical to the «world tree» image and, perhaps, semantically replaces it.

Modern peoples of the Pamir retain an idea of mountain goats being a «livestock» of celestial beings Peri, their ladies.

A horse, a sheep and a goat are the incarnations of ancient Iranian deities, they are «earthly and heavenly» by nature, move between Heaven and Earth and have significant sacral power. This justifies their role in sacrifices [Litvinsky, 2000, p. 286].

Dogs (wolfs). An important feature of steppe funeral rites with vehicles is a tradition of adjoining burial of dogs for cult purposes. Such a role in the pastoralist mythology is derived from its special position in the household as the most ancient domestic animal and an active helper in hunting and grazing large herds of cattle. The ritual role of dogs was known in the Cucuteni Tripoli culture, where dogs were buried both in settlements and in burial grounds. There was a practice of making amulets from dog canines and of painting their images on ceramics as «heavenly dogs» [Rybakov, 1981, Eneolithic USSR, 1982, p. 244].

An amulet of the canine dog, alone with grain and wheels, was found in a Catacomb cult tomb at the Bolotnoe village in the

Crimea. A complex relationship between the dog (wolf) image and solar symbolics is characteristic to the mythology of the Indo-Iranian Unity. Hittite ritual sacrifices of a dog before a horse burial and the Indian ashvamedha ritual are associated with the sky god [Kuzmina, 1977, p. 29, 38, 40].

A wolf-dog image in the ancient art of Central Asia already became an object of special study [Kubarev, Cheremisin, 1987, p. 98-117]. The authors examine development of the image from antiquity and note great similarity of iconographic features of the character with mythological views on it in large parts of eastern Eurasia.

D.G.Savinov upon studying wolve-dog images on deer stones in Mongolia, came to an important conclusion that appearance of this character is associated with the pictorial tradition of the Caucasus [Savinov, 1980, p. 319].

A single link between a dog-wolf image and a funerary rite was revealed on numerous ethnographical, folklore, visual and archaeological materials [Kubarev Cheremisin, 1987, p. 112-114]. For example, Ugrs and Mansi of the Ob' region buryied dogs in a wooden frame, decorated animal paws with black and red ribbons. A similar custom is known with Altai and Kazakh people. Wuhan and Xianbei tribes buried a dog with the deceased owner, pre-feeding and decorating it with colored laces [see: Moshinskaya, Lukina, 1982, p. 56-59; Viktorova, 1980, p. 125].

In Indo-European and Indo-Iranian mythology, dogs are placed to the underworld to act as chthonic beings. A mythologem about a dog-wolf, licking blood of a dying hero, was identified [Ivanov, 1977a, p. 152-165, 1977]. Soldiers' death on a battlefield was accepted as a sacrifice to the owner of the lower world Odin and his sacred animals, wolves and ravens [Kubarev Cheremisin, 1977, p. 113].

In the Rig Veda, the underworld god Yam is accompanied by two dogs of dark and light color, while Avesta prescribes to expose bodies of deceased to dogs, birds or wolves. When performing the ashvamedha sacrificial ritual, representatives of three lower castes would kill a «four-eyed» dog symbolizing the hostile power as a preliminary sacrifice.

Analyzing the various options of the Vedic myth of Shunahshepe («Dog's tail») and the Puranic myth of Harischandra, P.D. Sakharov came to a conclusion that they all stem from an original myth, which had, as a subject basis, an history of humiliation of a hero and its subsequent exaltation; the myth is associated with perceptions of the Solar Dynasty kings; had as main characters Viswamitra, Indra or Vasishtha; contained motifs of a dog; is connected to a ritual radzhasua (ascension to heaven) and the god Varuna [Sakharov, 1987, p. 82]. Perhaps, the pictorial series under consideration is related to this original myth.

The vehicle (chariot) image should be considered as opposition and struggle of two principles of good and evil in journeys between worlds of men and of gods. A principle of the good is represented by images of a chariot, «sun-headed» charioteer, mountain goat (a deer), and the evil by images of a dog, a snake. At the same time, all participating characters act as intermediaries between heaven and earth and adopt opposite functions. For example, a dog can accompany a hero to the underworld as well as to heavens while the hero's ascension.

Intermediary function of a vehicle is observed in burial rituals. The role of images of a deer or a ibex is less clear, but probably is identical to «the world tree» role, linking together all mythological spheres of habitation, present in subjects with chariots in the Near East glyptics, in petroglyphs and the vessel from Bronositsy.

About reconstruction of ritual practices

Since «a message» is a vital but only intergal part of any communication channel, it is important not only to decipher it, but to try to reconstruct the ways of its impact on a society within existing mythological concepts. In other words, «a message» always acts as part of a ritual, a tradition, a rite. It is impossible to «read» an image without reconstructing its entire communication channel. Now let's look at the basic components of a petroglyph communication channel.

Sanctuary. Contemporary expert views on petroglyphic sanctuaries were already communicated: they are seen as sacred places in mountains and foothills, at water bodies, as original open-air temples. It was these locations that accommodated petroglyphic channels of communication with their further development and utilization; their tools, «pictorial series», as any information system, were rendering their impact on clan members, participants of the event.

These might be dramatized mysteries, ritual sacrifices, Bacchic orgies, initiation rites, in short, all available and known then methods of influence on human consciousness. An obvious purpose of the rituals was formation of a society's own identity, realization of basic ideas of «own vs. alien», impacting its members to form a «correct» public opinion, which, in its turn, was generated by clan elders, priest-shamans and other leaders of the society. Natural functions of sanctuaries were training, information, education and entertainment.

Since many of the steppe societies lived in isolated, distant from each other, ecological niches, there was an urgent function of organization of general season holidays, which considered issues of selecting brides, celebrating «engagements» and marriages. The Bacchic rites are well known and described by ethnographers [Kosambi, 1968 Taylor, Fraser and others]. It is also remarkable that the shrine-temples were in use by different social groups and clans, as they were open for access and viewing. A road to that temple was always unhindered.

Petroglyphs of the Tamgaly sanctuary unambiguously tell us about certain ritual activity. Figures of «sun-headed» anthropomorphic creatures are surrounded by dancing disguised people. Moreover, a very act of creatin an image on mountain rocks, no doubt, had a magical meaning [Baiburin, 1993, p. 3] and by itself was a «miraculous» ritual, similar by its semantic significance and emotional impact to a process of sacrifice.

Vedic and Indo-Iranian traditions describe in detail some of the rituals: «radzhasuya» of ascension into heaven, «ashvamedha» of animal sacrifice and, above all, of horse sacrifice. It seems that only these very rituals could happen in the petroglyph sanctuaries, because the places optimally provide a mediating function of a direct contact with Heavens and a possibility to «ascend» It.

The mediating function of a sanctuary included its perception as a place for sacrifice, the most important element in any ritual-mythological system, organized in later periods into sustainable religious canons and doctrines.

Bringing gifts to gods and an act of killing and dismemberment of a victim to the glory of supreme deities is an effective act of «making a miracle» to use the might of the deities in own favor, and a tool of effective influence on fellow tribesmen. A strict hierarchy of sacrificial animals is precisely stated in the Vedic and Avestan written traditions: a man – a horse (camel) – bull – sheep – goat.

There is plenty of evidence for the existence of human sacrifice in the period under review. Ignoring the very fact of such horrendous acts, it was certainly a strong

«brainwashing» in terms of emotional impact and the communication channel effectiveness. If sacrifices took place during funeral ceremonies, why they could not be performed during a ritual in a petroglyph sanctuary? In both cases, the main task is all the same: to ensure a comfortable and secure travel to needed mythological worlds.

Sacrifices of «miraculous», magic animals, such as bulls, horses, goats, significant in routine life and providing «miraculous» relationship with other worlds, are close by power of their impact on a society and were surely practiced in the shrine-temples.

Altar. Researchers of petroglyphs distinguish the most archaic, «altar»-like spots by virtue of natural environmental conditions and content of multi-figured compositions there. Obviously, these are sanctuary altars, which make of the place a temple in classic religious-dogmatic meaning, different from any other cult place.

Z.S. Samashev suggests considereding «the world tree» image as an altar, a scene for sacrifice, common in visual monuments. This tree is a world universal axis that pierces vertically through the world and determines a certain reference frame defining the bottom, the middle and the top, or rather, the lower world (of chthonic, evil deities), the middle world (of all things: human, animal and flora) and the upper world (of good deities). Therefore, a tree, a pole, any other vertical axis can serve as a symbol of «the world tree», its visual embodiment, its sign, its metaphor [Samashev, 2010].

Therefore, it is appropriate to assume that needs to look for some central composition(s) in a sanctuary which defines a system of spatial and mythical coordinates for the whole monument, or at least for «a pictorial series» of a chronological period (or made with same iconographic features reflecting their general style).

Obviously, «the chariot pictorial series» is that main axis, which defines the whole «message» of such communication. To what extent this assumption is true will be shown by future researches on petroglyphs. Materials from the steppe and compact pictorial monuments at the Baikonur river valley in the Kazakh low hills are clearly in support of the assumption [Novozhenov, 2002].

Tools of communication. In some regard, the tool has already been mentioned earlier: the act of creation of petroglyphs> – pictorial series> – the mysteries and ritual sacrifices> – seasonal Bacchic festivals> – music, dancing and singing> – costume, jewelry> – the «language of poses and gestures».

Some of the positions should be recognized as lost forever. It is unlikely that we would ever know reliably what our far ancestors sang and danced during their bacchanalian feasts. Concerning other positions, they might discover their secrets inasmuch as new data will be generated. In any case, potentials for a comprehensive study of visual sources in Asia, I believe, are only beginning to be utilised.

For example, O.S Sovetova [2005, p. 237-241] drew attention to almost forgotten observations by academic N.Ya.Marr on «a language of jestures» in ritual and ceremonial acts, saying that essential significance was rendered by gestures, postures, rhythms, plastics, i.e. «patterns of movements», semantics and kinetic features of which were understood by contemporaries. Language of gestures, «hands' language» is connected, as emphasized N.Ya. Marr, to a «cosmic world view on three heavens», for example, an Oranta pose with a smile on face signified the sun, the heat, life, while without a smile it was the moon, the cold, sorrow [Marr, 1934]. Indeed, many of the postures of anthropomorphic characters in

petroglyphs were canonized, embodied in repetitive variants over huge areas. In case of vehicles, these are palms with «fingers spread apart» of joining anthropomorphs.

In general, the tool kit defined in the communication, even in case of lost fragments, by strength and effectiveness of their media resources and by impact (using modern terms) is estimated as a very advanced.

Now let us try to restore some parts of the horse ritual sacrifice, because the chariots complex, as it was shown in previous chapters, contains the custom as an important component. Many graves with horse skeletons accompany the chariot burials both in steppe graves and in Chinese chemakyns. The custom persisted with Sakas and Scythians, was practiced by the Hindus even in ethnographical time.

As noted above, there was an Indo-Aryan «ashvamedha»complex ritual of horse sacrifice at the world tree, recorded in the Vedic writings of the Rig Veda, the Yajur Veda and in later texts. The sacrifice of a white stallion Tvashtra (i.e., the world horse, as per the Rig Veda) to the god of heaven, making sacred fire at the pole, a symbol of the world axis and the world tree, and other actions of ashvamedha emphasized the cosmogonic nature of the rite. Mating of the stallion before sacrifice, a symbolic intercourse with it of the first wife of the king is associated with a fertility cult [Samashev, 1992, p. 200].

In the mythopoetic consciousness, a vertical pillar, a thethering post, was in correlated with the basic concept of the world tree, a vertical representation of the Universe Trinity. A thethering post, as an element of a three-piece world tree, on the other hand correlated with the sacrificial horse, three parts of which were emphasized in ashvamedha by splitting its body in three pieces: head, trunk and tail (symbolizing certain cosmological terms). This «tripartite» structure corresponds, in its turn, to three royal wives, associated in this case with three main spheres of the universe.

In ashvamedha, a sacrificial horse was tied to a post ibstalled in a pentagonal area. And the sacrifice was «transferred» to the god of the sun through the thethering post, the path between heaven and earth. This communicative function of the sacrificial post (and its semiotic equivalent of the sacrificial animal) in Vedic cosmology is beautifully illustrated in the hymns of the Rig Veda: «On a tree that connects with a leash, lead (the sacrificial animal) under the auspices of gods!» [RS, X, 70, 10].

Reconstruction the ashvamedha ritual on the base of the subject of a Kurchum composition found in the upper reaches of the Irtysh, Z.S.Samashev identified a circle-wheel with six spokes drawn near the horses (Fig. 184). In ashvamedha, a sacrificial pillar was topped by a wheel, the sun symbol, which reinforced sacred ties of the ritual structure with the very ritual of the deity. Probably, the wheel's numerical symbolism was charged with a complex meaning. Supposedly, the wheel image with six spokes symbolized the sun, the chariot and the seasonal character of the sacrifice ritual.

Figures of two opposing dogs were placed at the bottom of the Kurchum composition. The author notes that the dog played a significant role in the ashvamedha ritual, and treats the images as symbols of pre-sacrifice, while pair images of horses, people and dogs in the composition was probably related to the binary principles of semantic oppositions, with dual-cosmogonic concepts, with the twin cult. Hindu divine twins Ashvins («big-nosed», «owning horses» or «born from a horse») sometimes appear as two horses, closely linked to the «asvattha as a world tree»; their image is clearly traced by an ancient Indo-European

cult of twins. A pertinent analogy here is a pair of horses at the «world tree» shown in the Varchin slab of the Karasuk grave.

And finally, a figure at the bottom of the composition, judging by the pose (arms spread out sideways, legs without feet), can be regarded as a human sacrifice; the image of a boiler with a wide underpan and vertical handles, apart from its connection to the sacrifice ritual, is a symbol of community's wealth and prosperity [Samashev, 2010; see Dzhumabekova, 1996, p. 83-89]. There is a camel figure in the composition which differs stylistically, compositionally and narratively from all otheer figures.

In the strict hierarchy of sacrificial animals, recorded in numerous written sources, the Vedic tradition kept a horse in the first place, while the Indo-Iranian tradition put a camel in the first place. Perhaps, the composition under consideration demonstrates an interesting moment of «correcting» or adapting «the message» and the whole «pictorial series» to «their» communicative channel.

Thus, a sanctuary with petroglyphs is as a place of a communication channel between the world of «the alive» and the worlds of «gods», where images of vehicles and chariots played a crucial connecting, mediating role in «traveling» between these worlds, providing all associated benefits and «miracles», for those who committed the ritual of «ascension». To enhance an emotional effect, the ritual was accompanied by sacrifices.

Response of communication participants presupposes strengthening of society's self-identity, «miraculous» support by gods in deciding problems, a holy faith of belonging to a given clan, from now on secured with strong support of the «miraculous» deities.

With respect to the chariot image, the very act of its creations on rocks of the sanctuary, as well as the proper «message», contained by this communicative channel, recorded the fact of presence of a «miraculous» divine powers – of a hero of the Solar dynasty – and the ability to ascend from this place to the world of gods. The hero is able to make any kind of exploit in the name of his clan, to bring concrete benefits to all its members. It is him, a mythical progenitor of their clan, «chosen by the god» and «kept by the deity». Worshipping the image is preceded by the sacrifice of pair of goats, and the ritual is accompanied by sacrifice of at least a pair of horses. Judging by significance of animal sacrifices, the hero belonged to a cohort of the most revered deities of the Pantheon, with whom a current leader of the clan could be identified.

The meaning of the message could be: «... I am a leader of the clan .. Your earthly son, committing all relevant rites and sacrifices for your glory, oh, keeping my people and giving the strength and fertility of my fat herds, wealth and prosperity of my people... Allow me to ascend to Heaven, join the world of gods... thanks to your strength and support I find with the chariot best pastures and valleys with lush grass... my arms, my chariot, covered with your miraculous power, protect me and my people against all enemies, ...I bring this sacrifice in order to enlist your support and receive the blessing for the future for myself and my proxis... Let my relatives, thanks to your support, help me further in my endeavors ...» ■

Afterword

Fig. 184. Kazakhstan.Tarbagatai. Kurchum. The scene of the ritual «ashvamedkha» [Samashev, 1992].

The cultural-historical process and the developed communication channels in the steppe Eurasia seem to be a continuous change of the individual cycles. Each cycle is repeated in its structure on a new level and consists of two periods: unstable (passionate) and stable; the first is characteriazed by multitude of new channels of communication on the basis of technological innovations, new skills and techniques, while the second, by establishment of final versions of the most effective among these.

The first cycle (3300-2500 BC): a steppe pastoralist community is formed; it is a suite of archaeological cultures of common origin. The genesis of the community of individual clans is focused on mobile lifestyles and conditioned by the following components:

• Migrations of population from Anatolia and northern Syria through the Caucasus manifested in the monuments of the Maikop culture;

• A synthesis (interaction) of the culture natives with the local population, manifested in the monuments of the Novotitorovo, Novosvobodnaya, Kemi-Oba type;

• Separation from major agricultural structures, such as Tripoli-Cucuteni, of some groups focused on predominant livestock-breeding, manifested in the Usatovo monuments;

• Formation of societies in the Volga region, authors of Sredni Stog, Khvalynsk monuments;

Climate aridisation in the early 3rd millennium BC predetermined these processes and the formation of a new type of economy, mobile cattle-breeding. First experiments with domestication of new species of animals and efforts of their breeding at home led to a need to maintain a mobile lifestyle and search for new grazing land for the livestock. Covered wagon on disc

wheels, drawn by a pair of oxen, becomes a main type of dwelling of these small groups of first pastoralists.

Different relationships with the population of Central and Eastern Europe are actively developing, which was manifested in "intermingled" coexistence of the ancient Pit's and local cultures. It was the process of gradual penetration by individual groups of ancient Pit's cultural and historical community. Channels of communication develop within the very community of ancient Pit's, between groups of nomadic pastoralists; the common mythological concepts, cults, rituals, original communication channels are beeng formed.

In the second quarter of the 3rd millennium BC, cultural and historical processes are stabilized. This was reflected in the final establishment of livestock-breeding as a main economy type and formation of multiple versions of the ancient Pit's of cultural and historical communities as individual archaeological cultures, the production sector of which was focused on specific natural and environmental conditions. In fact, a pastoralist community is made of small work groups of patriarchal families, 20-30 people each, united among themselves by a similar type of economy, close material culture and a system of mythological concepts. Own pictorial tradition was developing too. They were genetically (anthropologically) related groups speaking in dialects or a common language. The guaranteed productivity of livestock, as opposed to risk-taking activities in agriculture, was a prerequisite for a stable population growth in groups of herders, reducing child mortality.

The second cycle (2500-2000 BC) is associated with migrations of individual pastoralist groups to sparsely populated areas of the eastern Eurasian steppes and with development of new pastures here; with emergence of archaeological cultures that date back to a common ancient Pit's basis. Monuments of Pit's-Afanasievo appearance can map the way. A transcontinental transport corridor is formed with branched channels of internal and external communications. There are two directions: the north one went along the steppe border and forest-steppe zones of the Minusinsk Basin and across the Altai Mountains to the steppes of western Mongolia; the south direction went through the Ural-Kazakhstan steppes to Central Asia and from Mesopotamia to Turan and Harappa.

Groups of first "settlers" have become the ethnic basis of the emerging Afanasievo culture in Southern Siberia, the Altai, Xinjiang and western Mongolia. Monuments, found in the areas, demonstrate similarity of materials, anthropological type of their creators and similarity of mythological ideas, expressed in pictorial monuments. The latter exhibits remarkable coincidences in individual images and their style, both among themselves and with those of western and southern monuments. Steppe tradition of decorating the walls of tombs and vans, known from finds in Novosvobodnaya, Novotitorovo, Kemi-Oba, Usatovo monuments, is further developed on slabs of burial grounds Tas Haza, Chernovaya VIII, Karakol. A tradition to set steles and anthropomorphic statues groups in southern Siberia, Mongolia and Kazakhstan is linked to migrations of ancient Pit's people.

Numerous images typical of cults, recorded among the tribes of Cucuteni Tripoli community, were visually embodied in the Eneolithic petroglyphs of Chuluut. An image of the "sun-bird-headed" anthropomorph with fingers spread appears on tomb slabs and in synchronous petroglyphs, which was found in more southern monuments of Central Asia, up to Harappa. Means of the migration – covered wagon, carts and gigs – are depicted on rocks and stone sculptures.

In the last quarter of the 3rd – early 2nd millennium BC, stabilization of the cultural and historical processes has expressed itself in local development of Afanasievo and Okunevo in the north and Zamanbaba cultures in the south. Obviously, under their influence were some family groups of nomadic pastoralists, settled in various parts of the steppe area, between the above cultures. These groups and their development in time gave ground to numerous archaeological cultures of the next cycle.

Channels of communication, established in the first cycle, developed also in the period under consideration. West contacts were directed to synchronous cultures of Central and Eastern Europe, in south-west toward the Middle Eastern civilizations, which is confirmed by findings of vehicles, domesticated horses in the cultures of the Caucasus and the "movements" of metal products. Steppe pastoralists, as well as synchronous cultures of the Caucasus acted as mediators in relationships between the Near Eastern peoples and tribes of prehistoric Europe.

The third cycle (2000-1100 BC) is the most brilliant and relatively well-studied period of development of ethnic and cultural processes. Channels of communication already existent in the steppes get intensified in all directions.

Possible reasons lie in: the invention of two-horse chariots, dynamic converged development of the existing populations in different regions and their intensive contacts, possibly, conflicts of interests, significantly increased role of metal products in life of those societies. And this is just a small portion of reasons leading to significant spatial displacements of many societies. Distribution of Seima-Turbino monuments suggests the move of their creators from east to west. There are no theoretical reservations gainst existence at this time of a transcontinental communication channel, acting from west to east and vice versa.

Process of Semino-Turbino groups' movement, natives of original metallurgical tradition, is a second major wave of migration from east to west, which incorporated production groups of metallurgist-smiths into various local cultural formations: Abashevo, Early Timber Grave, Sintashta-Petrovo, Early Alacul, Samus' and other cultures.

Production groups of Seima-Turbino could represent large pastoralist patriarchal families of blood relatives, specializing in cattle-breeding and blacksmithing. The process of such integration is obviously facilitated by ethnic kinship and interest in mutual services. "The second wave of migrants" coincided with the followingdirection of migration of Pit's groups: to the Minusinsk basin, through the Altai in Mongolia and northern China, across the Kazakh steppe to south. This movement is reflected in the rare but striking Seima-Turbino burial grounds, treasures, sanctuaries and pictorial monuments of the Altai, Eastern and Central Kazakhstan and Kyrgyzstan.

At the same time, it seems that not only Seima Turbino production cells moved in space, but larger new ethnic formations containing also the Seima Turbino component. This component is most clearly manifested in the groups, which resettled in Mongolia and northern China.

I believe that in the western part of Eurasia similar processes occurred at this time [Bartonek, 1991, p. 223-291]. Sharply increased amount of metal delivered from southern agricultural areas to steppe communities and rapid spread of Seima Turbino products across the steppe belt zone appear to be interrelated phenomena. I assume direct penetration of Seima Turbino and other steppe population groups through the Caucasus to the Asia Minor, up to the Iranian plateau. Perhaps, the fact of their stay was fixed in finds of famous Luristan bronze

goods, which suddenly appear at a later time and are associated with the Seima-Turbino metallurgical tradition, which became the basis for their local development.

By the mid-2nd millennium BC, there are significant groups throughout the Eurasian steppe: the Timber Grave, Andronovo, Karasuk, Tazabagiab. Relations between them are systemic and intense. Local migration of part of Fedorovo population to south to the Alakul' environment was observed, and of Post-Seima-Turbino or Karasuk groups to northern China and Mongolia, to the Minusinsk basin. There have been local movements of smaller pastoralist entities. Southbound interconnections with the farming civilization of Turan took the final shape. Judging by written and archaeological sources, Seima Turbino and Karasuk cattle-breeding and chariot groups were the third factor in military clashes in between the Early Chinese States, playing an important role in their foreign policy.

The period of stable development was accompanied everywhere by the process of consolidation of small groups of cattle-breeders into large ethnic communities.

The fourth cycle (1100-700 BC) is characterized by a new advancement of Karasuk tribes to west through the Altai to the Ural-Kazakhstan steppes. According to archaeological data, the penetration is manifested in formation of a suite of archaeological cultures of Karasuk appearance: Elovo, Irmen, Begazy-Dandybay in Central Kazakhstan. It was most brightly manifested in pictorial monuments of Southern Siberia. A layer of images of the Late Bronze Age was formed in petroglyphs of Middle and Central Asia.

Cultural and historical processes in the eastern part of the Eurasian steppe were determined by active interaction of two population groups, Post-Andronovo and Karasuk, by conflict potentials between the two ethnically similar goups, although self-sufficient and independent. Other ethnically distinct and the smaller societies inevitably were involved in the sphere of their interests.

As a result of complex ethno-cultural processes, movements and the consolidation of separate groups, a period of stabilization comes, manifested in the formation of large communities: Scythian in the west, Saka in the east, and the Tagar culture in Southern Siberia, representing the local development of the remaining part of the Karasuk-proto-Turkic tribes, with possibility of identifying it as a Cimmerian. A new stage in the history of the steppe pastoralist communities began.

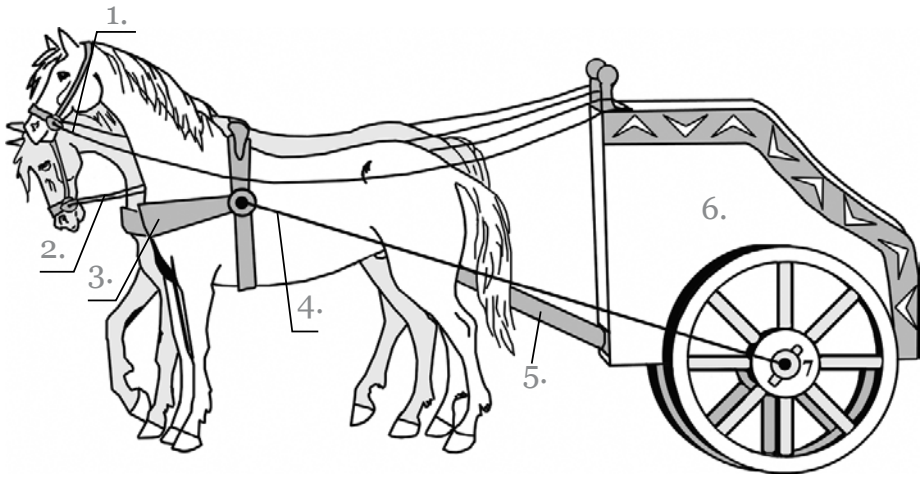
If we compare the cycles outlined above with the dynamics of cultural-historical processes in the Middle East agricultural societies, we find discrepancy in their developments. In the ancient Middle East, the processes occured much faster, while the global "breaks"of cultures in the steppe Eurasia were relatively seldom.

The conclusion is explained by the "unlimited" movements of pastoralist groups and greater traditionality of this kind of economy, in its conservatism. Two contact zones exist between the worlds of pastoralists and farmers: the ancient societies of the Caucasus and the Turanian civilization. These societies acted as mediators in contact of pastoralists with ancient states of Mesopotamia in the west and with the Harappan civilization in the east.

If we compare the above cycles and stages of development of Central Asian pictorial traditions, we find that the most striking and significant impulses in the evolution of the latter correspond to periods of instability and population displacements. Obviously, these correspondences coincide chronologically too. ■

Glossary

[Littauer, Crouwel, 1979; Epimakhov, Chechushkov, 2008, Gurevich, 2000]



Classic chariot: 1 – psalii; 2 – reins; 3 – shorka; 4 – traces; 5 – central draught-pole; 6 – body; 7 – hub. [Chechushkov, Epimakhov, 2006, fig. 3].

A-shaped vehicle: a two-wheeled vehicle, with a trapezoidal decking area on side beams, forming a triangle. These beams are simultaneously a draught-pole, to the top of which a yoke is attached. The vehicle's shape reminds the capital letter "A".

A-shaped draught-pole: a pole shaped as an elongated letter "A", to the top of which is a yoke's crossbar is attached.

Additional holes: a row of small holes in a plate, directed perpendicularly or at an angle, for attaching the headband straps to psalii.

Allure: a natural pace of forward linear movement by horse, such as step, trot, amble, and canter known without prior training.

Attributes of a charioteer: a spear (копьё Russ., lance Fr.), a whip (кнут Russ., fouet Fr.), a bow (лук Russ., arc Fr.), and a goad (стрекало Russ., aiguillon Fr.).

Axis, axle (ось Russ., essieu Fr.): a rod, passing under the decking of a vehicle, is attached to wheels; if the attachment is rigid, the axis rotates with the wheel (were always made of wood).

Backband (чересседельник Russ., dossière Fr.): in the shaft bow (arch) harnessing method, a leather or canvas strap, fixing both shafts across the horse back, on a paddle.

Beams, rays (лучи Russ., rayons Fr.): in petroglyphs, a halo around human head.

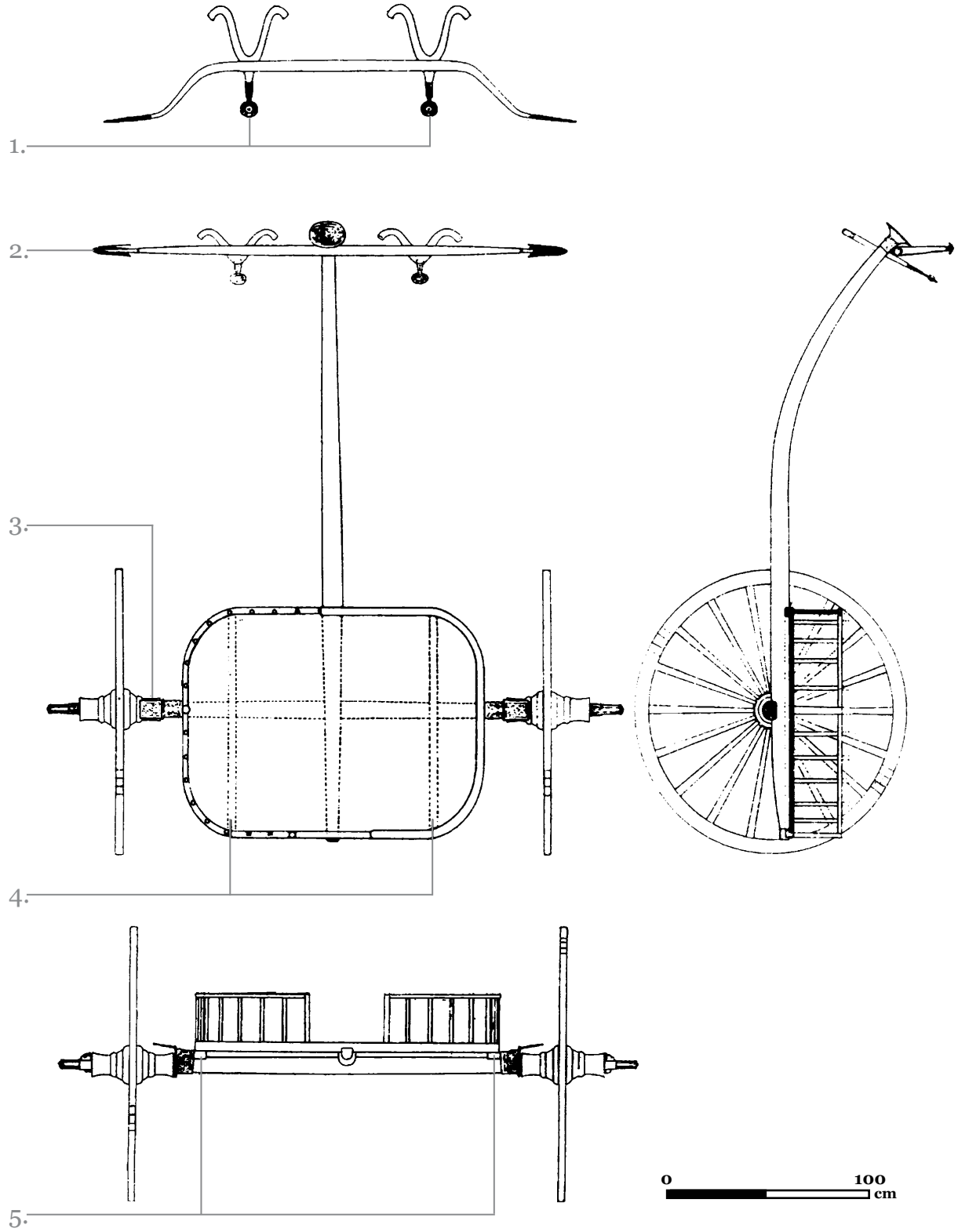
Bit (удила Russ., mors Fr.): a common name of all types of snaffles and mouthpieces, used for bridling a horse. It consists of two parts: one is placed in the animal's mouth, the other – on its cheeks (psalii). The earliest bits were made of woven straps or intestines, or ropes, and the psaliis from horns of deer, elk, or bone material. Psalii served as gags to fix the oral part of the bit and keep them from slipping sideways. Metal bits, integral or composite, were used in combination with a pair of the psalii. The reins were attached to the ends of the oral part of the bridle (passing through the psalii), or the metal parts of the psalii. The action of these fished close to the function of modern bits. Ancient and modern bridle bits are putting pressure on the corners of the horse's mouth, but unlike the old system – the additional pressure exerted on the lower jaw of a horse.

Blinders (шоры Russ., œillères Fr.): an element that connects all the straps of headband and shields a horse's eyes, causing it to look ahead. In ancient times, this element may serve to protect the eyes of animals in the battle or to prevent clashes between stallions running in a team.

Body, box (кузов Russ, caisse Fr.): a vehicle's decking or a superstructure. There is a lower part of the vehicle, beneath the body, which is called an undercarriage (шасси Russ, chassis Fr.).
Breeching (шлея Russ., avaloire Fr.): a strap that connects the fore edges of pad or blanket of the saddle's and passing around the horse's chest, allowing t fix the saddle on its body. In case of Assyrian chariot horses in 8-7 cc. BC, this strap was joined to the girth on two sides.
Breastplate: in ancient times, a protective or decorative element on a horse chest.
Bridle (узда Russ., bride Fr.): a system of straps consisting of a headband, bits (not always) and the reins; allows controlling the horse's head.
Bridle bit / mouth-piece / (bit) canon (грызло Russ., tige Fr.): a part of a compounded / solid metallic bit, inserted in the mouth of a horse; reins are attached to loops at the bit sides.
Browband (налобный ремень Russ.): a part of the headband straps located on the forehead of a horse to fix the head strap against slipping.
Capsule (капсуль Russ.): a device preventing a horse's mouth to open wide, a noseband.
Cavesson (кавессон Russ.): strong, well-fitted headband straps connected to reins.
Chariot (колесница Russ., char Fr.): a light rapid two-wheeled vehicle with wheel spokes, usually drawn by horses; used in battles, for hunting, in ceremonies. The chariot's crewmen stand or sit on knees (in chinese chariots).
Chariots complex (колесничный комплекс Russ.): a collection of finds, including chariots, draught animals, the horse harness parts (psalii), including a warrior-charioteer's set of equipment.
Contour (контур Russ., contour Eng, Fr.): in petroglyphs, a technique of making an image by outlining.
Cross-bar wheel (кроссбаровое колесо Russ., crossbar Fr.): a rimmed wheel with intersecting bars, the crossing of which is passed by the axis. In a broad sense: a lightweight disc wheel with grooves.
Crupper (подхвостник Russ.): a strap, which in ancient times extended from the back of the saddle across the croup of a horse around the roots of the tail, with a purpose to fix the saddle.
Disc wheel (дисковое колесо Russ., roue plein – Fr.): a massive or "bloc" wheel made from one or several pieces of solid wood, a "combo" disc wheel.
Draught-pole (дышло Russ., timon Fr.): a two-horse harness device, a long pole, connecting to the front of a vehicle. Harnessed horses are positioned on sides of the draught-pole.
Engraving (graffiti Eng., гравировка Russ., grave Fr.): an image on rocks carved out in thin lines.
Feet (ступня Russ., pied Fr.): in petroglyphs, characteristic thickening of feet of a man's figure always shown "in profile".
Format of a horse: a ratio of height at the shoulder (withers) and length of a horse body. Ridden horses have mostly a square format while draught animals a rectangular format.
Gauge (колея Russ., voie Fr.): a distance between the wheels of a vehicle.
Gig (двуколка Russ., curette – Fr.): a two-wheeled vehicle with wheels of various types for carrying either goods or passengers.
Harness (упряжь, сбруя Russ., harnais Fr.): a system of straps connecting a vehicle to draught animals. Its basic elements in ancient times were: a throat lash, a collar, a fixator and a traces (постромки – Russ., traits-Fr.).
Headband (оголовье Russ.): a parietal part of the bridle made of a strap or rope; fixes the halter and a snaffle bit in place; includes cheek straps extending from the crown to the noseband or the bit, a throat lash, a brow band going across the forehead (often absent), and a noseband.
Headstrap (суголовный ремень Russ.): a main part of the headband design; a strap embracing a horse head and consisting of two cheek straps.

Hooves (копыта Russ., sabots Fr.): in petroglyphs, characteristic thickening of animal feet of a rounded, triangular or rectangular shape.
Girth (подпруга Russ.): a strap, surrounding a horse chest, or connecting the lower ends of pads or blankets of the saddle under the belly of the horse.
Goad (стрекало Russ.): a pointed rod to control a horse, a bull; in the petroglyphs are often depicted as touching the croup of the animal.
Koliaska (carriage Eng., voiture Fr.): a two- or four-wheeled graceful carriage for business or pleasure in old Russia.
Leash (поводок Russ.): a headband strap for tying horses.
Linchpin (чека Russ., esse, clavette Fr.): a lock on the wheels outside the axis.
Linear (линейный Russ): a petroglyph making technique by drawing an animal body in a single line.
Lock of harness (фиксатор сбруи Russ.): an element of the harness which fixes its other elements on the body of an animal. In the 2nd millennium BC, it was a strap that connected the lower ends of the yoke-saddles or passed from the outside of the lower end of the yoke-saddle to the draught-pole and surrounded the bottom of the belly of the animal. In the 1st millennium BC, the system was transformed into a combination of the girth and the breeching.
Nave (ступица Russ., moyeu Fr.): a central part of the wheel with sockets along its perimeter for the spokes and the nave-band to mount over the axle. Nave-band (втулка ступицы – Russ., frette de moyeu Fr.).
Noseband (нахрапный ремень, переносье Russ.): a part of the headband, a strap, located on the bridge of the horse's nose.
Nosepad (носовая накладка Russ.): a protective or decorative element of the horse harness, located on a nose part of the horse, often in combination with a standing, plucked or trimmed mane.
Outrunner (пристяжная лошадь Russ.): not a very accurate name for one of the three (in a biga) or of the two (in a quadriga) horses which are not necessarily under the yoke, but are more loosely connected to a vehicle by traces.
Psalii Gr., (cheek-piece Eng., псалий Russ., aile (dumors) Fr.): a part of the ancient harness made of bone, horn or metal; used as a means of control of horse by impacting the cheeks, as well as a regulator of headband straps.
"Psalion": a Greek word for a metal psalii, separated from the bit, always in combination with a spectacular "halter" or "a noseband".
Psali's bracket hooks: lugs on sides of the bracket, designed to secure the head strap.
Painting (роспись Russ., peint Fr.): images made with organic colors (ochre).
Plank (планка Russ.): an optional part of psalii; usually is marked by thinning from outside; comparing to the shield, has side hooks to fix headband straps.
Pecking (выбивка Russ., marteli Fr.): a petroglyph making technique.
Projection on withers (выступ на холке Russ., saillie Fr.): an element in the form of a triangular or circular protrusion, usually located above the animal's front legs.
Reins (вожжи Russ., guides Fr.): straps extending from the ends of a snaffle bit to a driver, to control the draught horse. There are one-horse and two-horses reins.
Rug (попона Russ.): a veil protecting against sweat and decorating the body of the horse.
Shafts (оглобли Russ., brancards Fr.): one-horse harness device consisting of two long poles, fastened to the front of the vehicle, on side of the horse. The Russian troika is also harnessed in shafts.
Shaft horse, wheeler (коренная лошадь Russ.): one of two horses, at one side of the draught-pole.
Silhouette (силуэт Russ., silhouette Fr.): a way to draw petroglyphs on rocks by solid pecking or by tracing the entire area of a figure.
Spoke (спица Russ., rayon Fr.): an element is located radially on the inside of the wheel. One end is inserted into the rim's groove, the other into the groove of the nave.

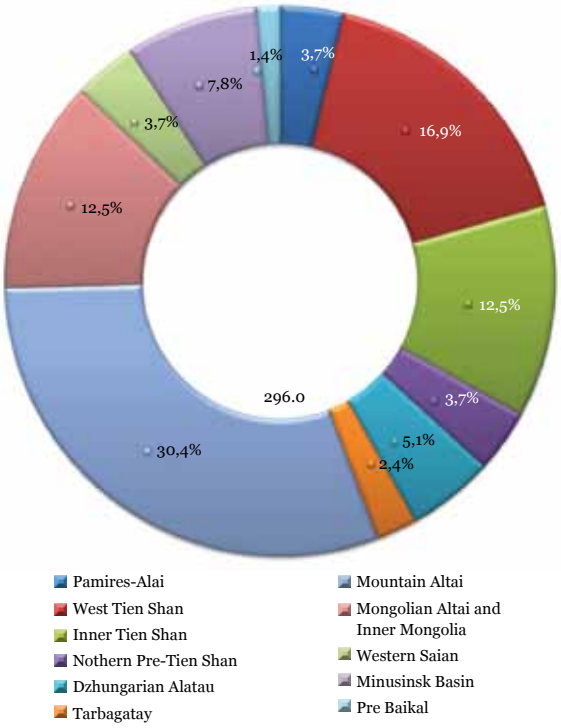
Snaffle (trenzel): kind of a bit, consisting of the mouth-piece and two rings, by which the snaffle is attached to the cheek straps of the headband. The rings are also attached to reins. In the horse mouth, a bit rests on the tongue and toothless edges of the lower jaw, touching the corners of its mouth.
Spoke wheel (колесо со спицами Russ., roue a rayons Fr.): lightweight wheel made up of a rim, spokes, naves; often equipped with a separate felloe (обод Russ., jante Fr.), and sometimes with tyres (шина Russ., bandage Fr.).
Tassel (кисточка Russ., gland Fr.): a tail thickening element of an animal's image engraved or pecked on rock.
Terret, rein-ring (zga O.Russ., passe-guide Fr.): these rings are passed by driving reins; tied up to the draught-pole or the yoke, or fixed on a draught animals.
Tilt (крыша, навес Russ., bache Fr.): a wagon canopy made of linen, wood or twigs.
Toothless edges: edges of the horse jaw ranging from an incisor to a first premolar. A bridled horse has the snaffle resting on its toothless edges of the lower jaw, so their shape and sensitivity are very important for the control of the animal.
Throat strap (горловой ремень Russ.): a strap passing from one cheek to the other under the horse's lower jaw.
Trenzel's headband: a main part of the horse tack, to be put on a horse head, allowing to control the animal; includes a noseband, a brow band, etc.
Vehicle (повозка Russ., vehicule Fr.): a general term for any wheeled vehicles.
Volutes (волюты Russ., volutes Fr.): a decorative element in depicting an animal in the form of a characteristic curl. An attribute of the Scythian-Sacas "animalistic" style.
Wagon (телега Russ., chariot Fr.): always a spacious four-wheeled heavy vehicle; a covered wagon is called a van.
Withers, height at the shoulder: height of equines from the ground to withers.
Wheel grooves (колесные канавки Russ.): subrectangular in plan and lenticular in section grooves found on bottom of burial pits; traces of a couple of wheels dug into the ground.
Yoke (ярмо Russ., joug Fr.): yoke on horns (horn-yoke, joug de cornes-Fr.): a harness device replacing a collar (neck yoke Eng., joug d'encolure Fr.). It is a bar, attached to the draught-pole.
Yoke-saddle (ярмо-рогатка Russ., fourchon d'encolure Fr.): a special item, "the saddle for a yoke"; provides a more convenient joining of draught animals to the yoke crossbar. The shape resembles an inverted «Y», top of which is attached to the crossbar of the yoke, and the two "legs" are rested the animals' shoulders.
Y-shaped pole: a composite draught-pole made of two bars, extending from a vehicle as a Y-shaped stick.



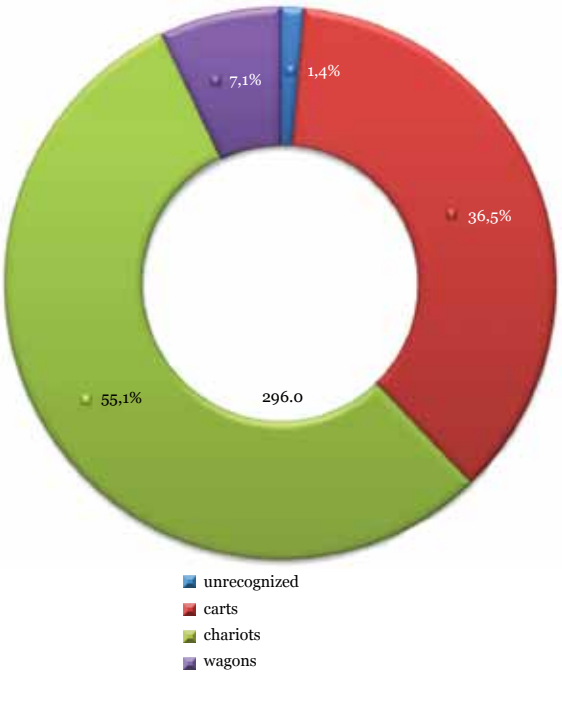
China. Reconstruction of the Western Zhou chariot (about 1050-771 BC) from Xinkun, tomb1: 1 – pommel of the yoke-saddle (bells); 2 – Helm of the ends of the yoke; 3 – axis inner fixators for wheels; 4 – beams (trimmer) to strengthen the platform for the charioteer; 5 – support of the platform for charioteer [Wagner, 2004, abb. 4].

Application 1. Visualization of attributes in a database.

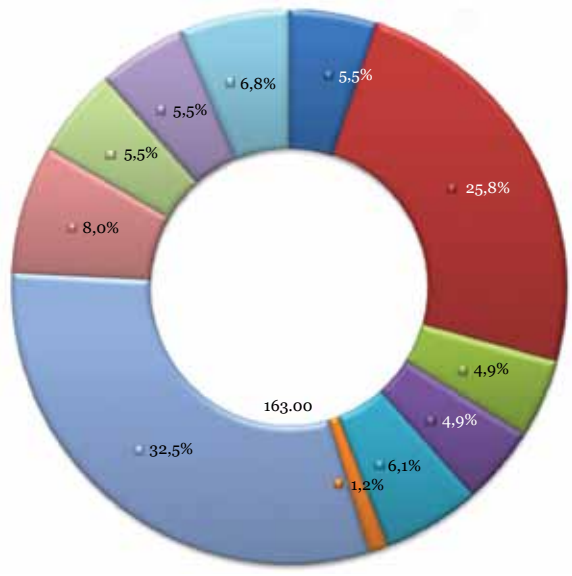
Spread of vehicles images in regions



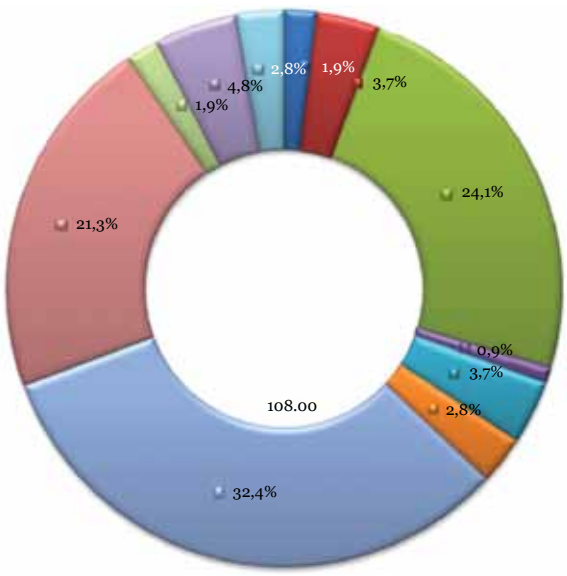
Ratio of vehicles types: wagons, gigs, chariots



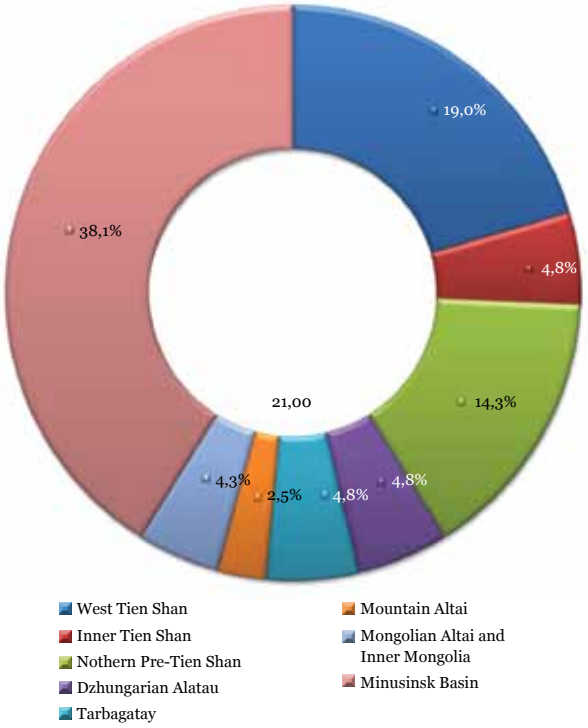
Spread of images



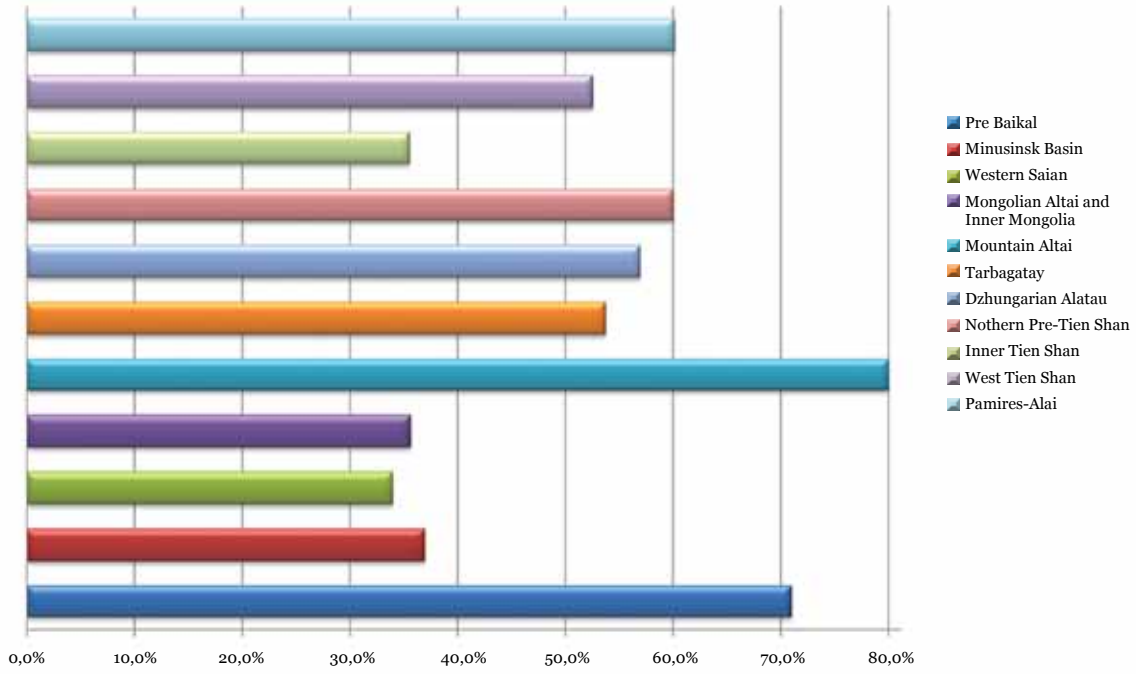
Spread of images



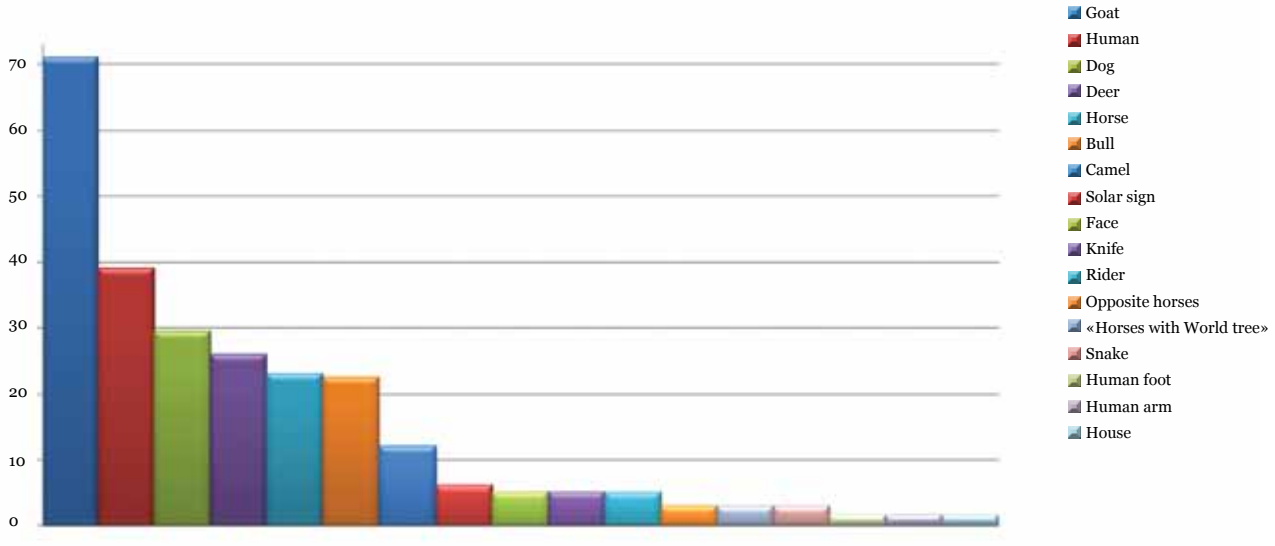
Spread of wagons in regions



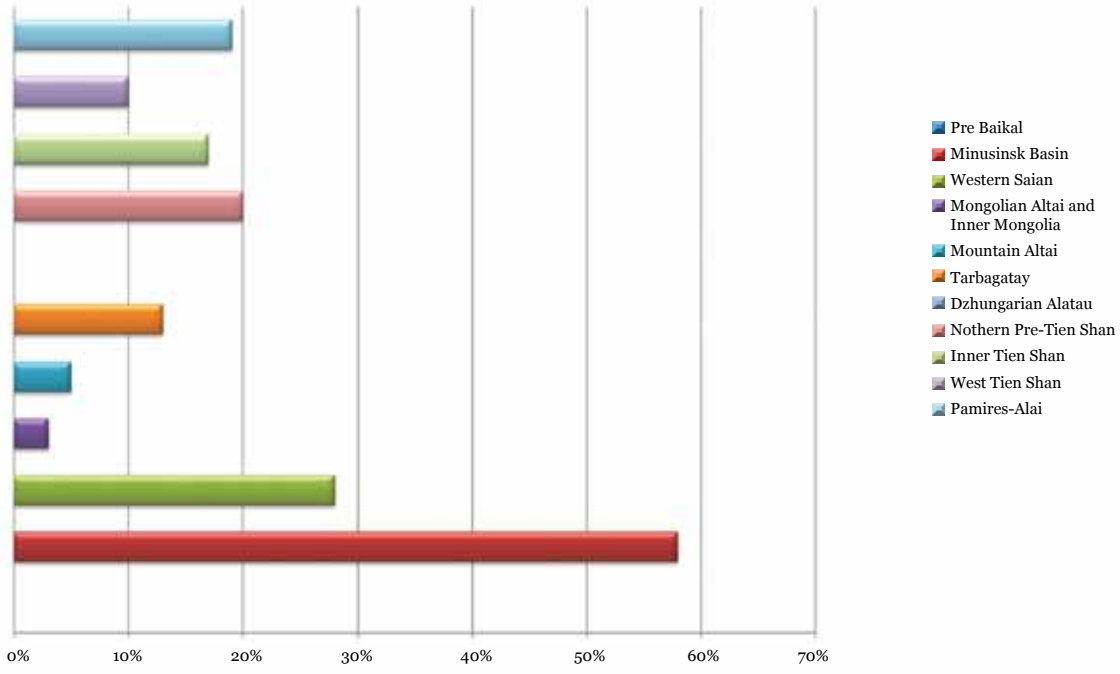
Vehicles compositions in regions



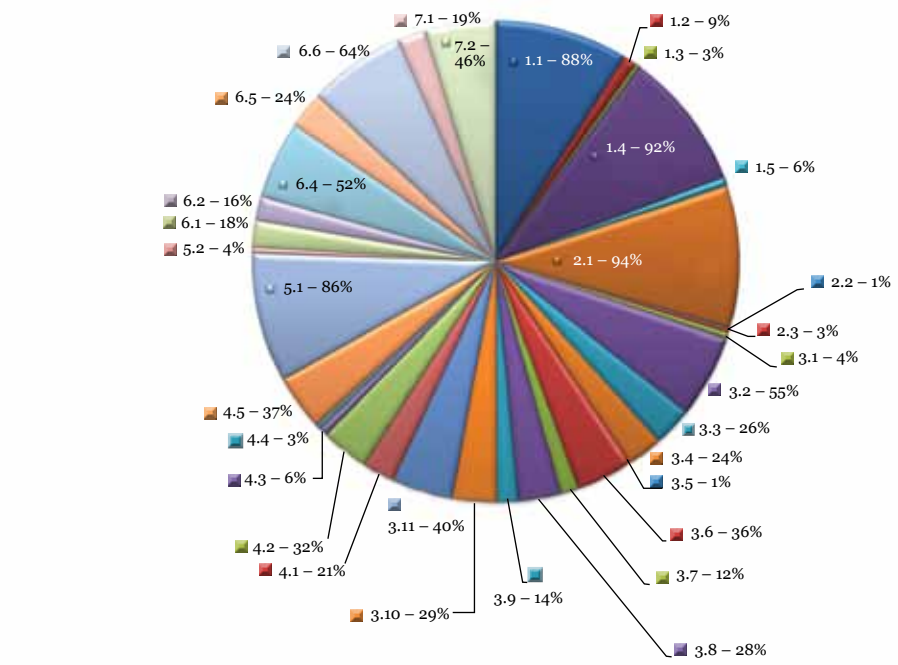
Vehicles and other personages in all regions



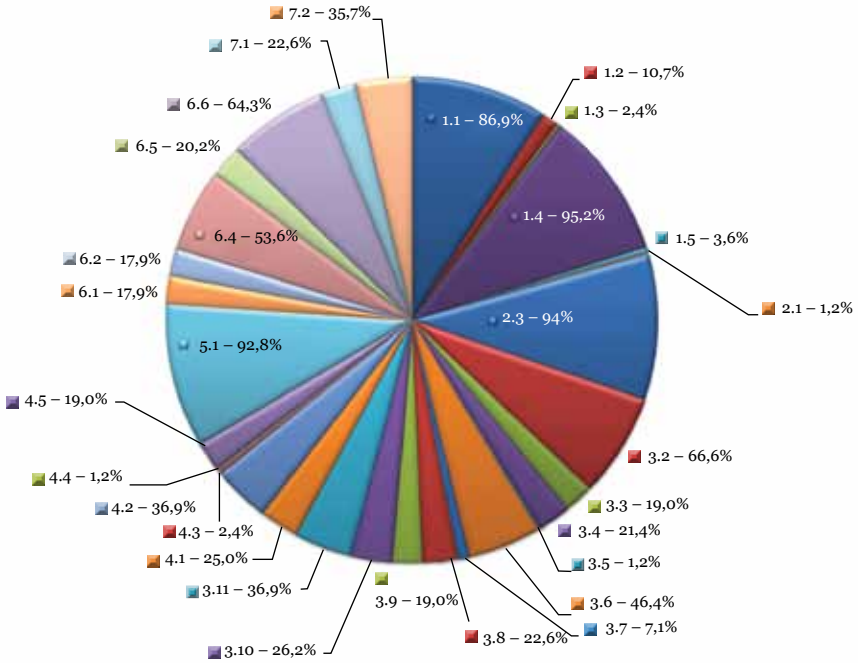
Vehicles in regions



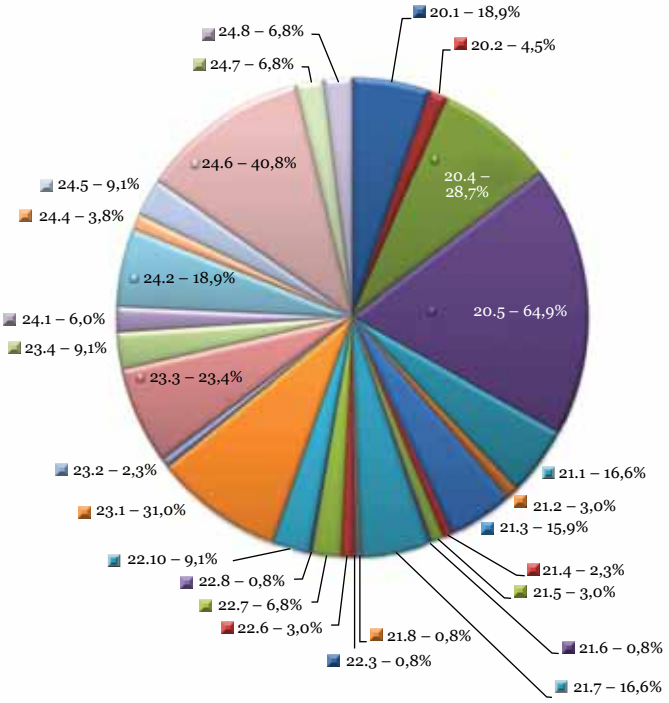
Gigs in regions. Technic and construction



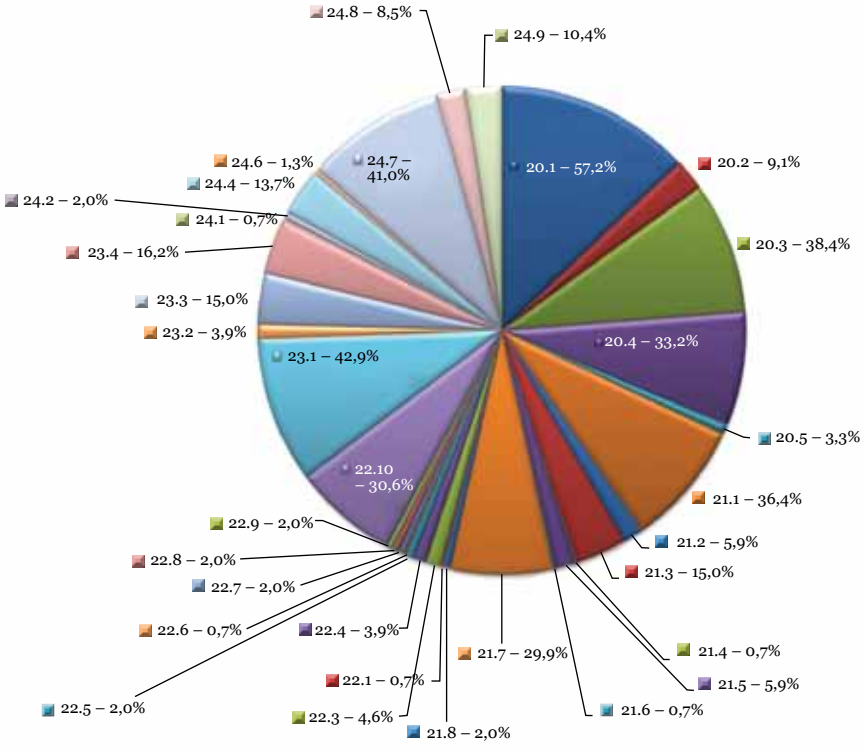
Chariots in regions. Technic and construction



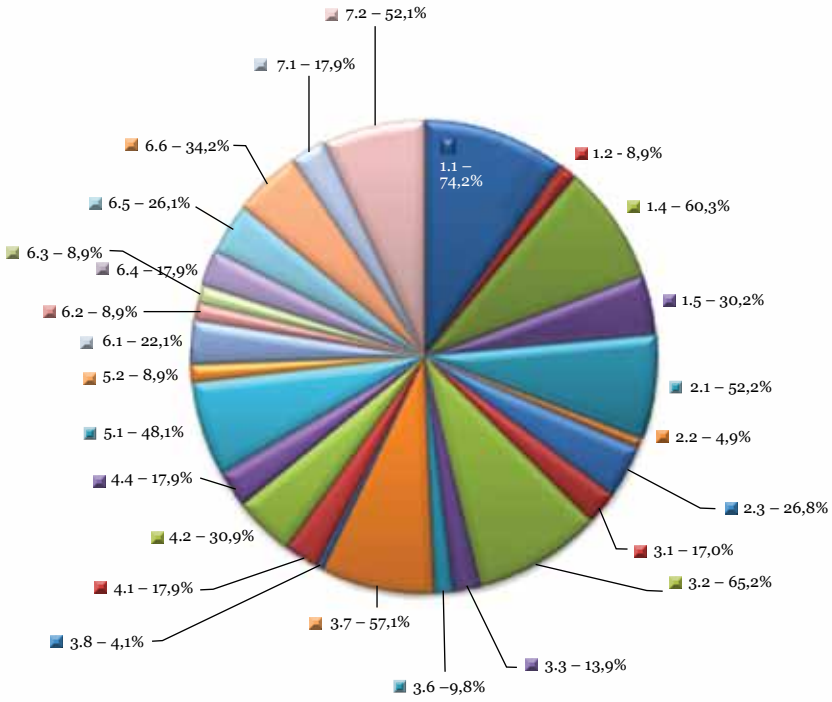
Gigs in regions. Iconography



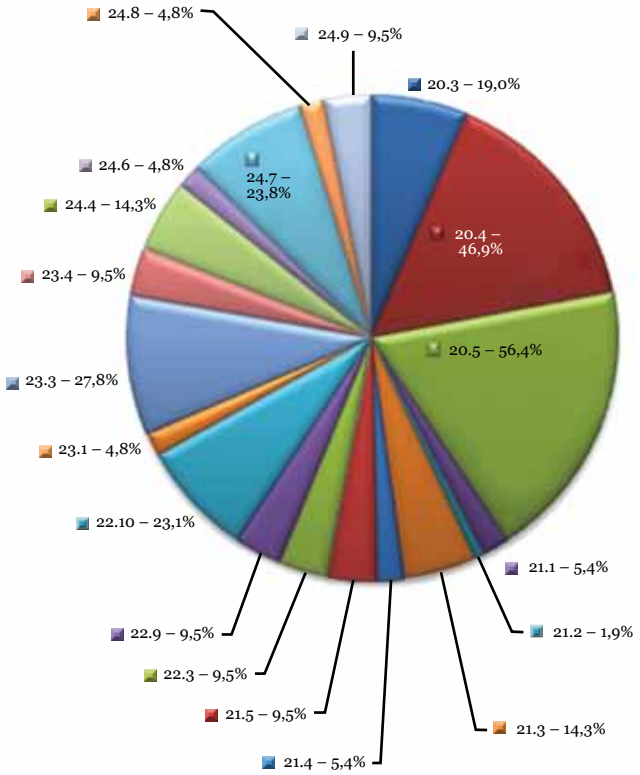
Chariots in regions. Iconography



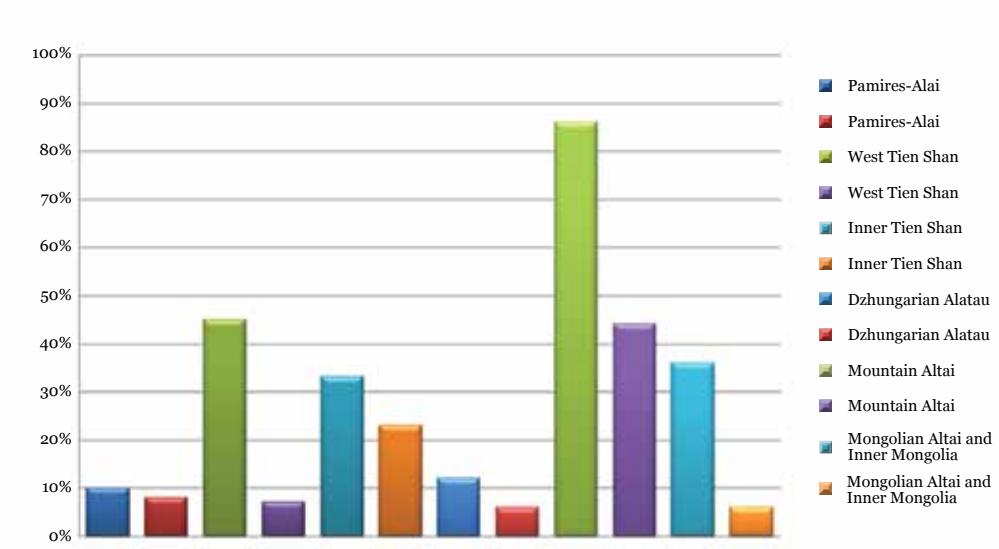
Wagons in regions. Technic and construction



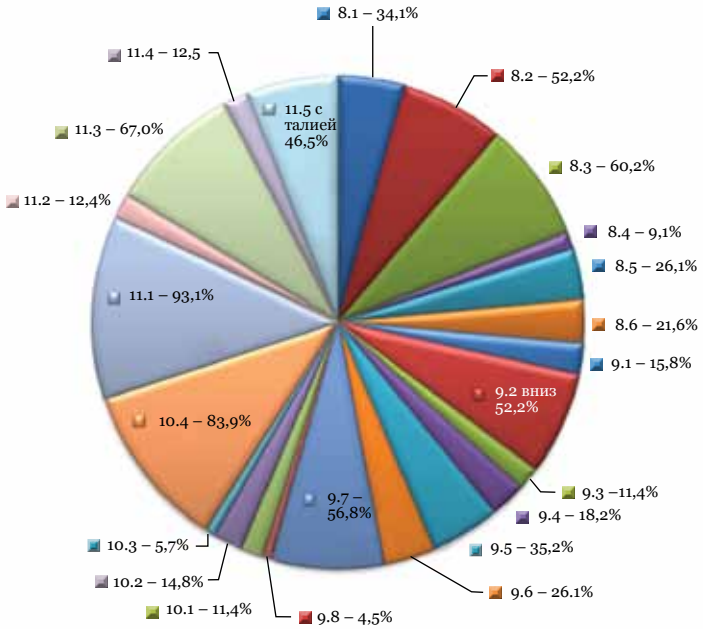
Wagons in regions. Iconography



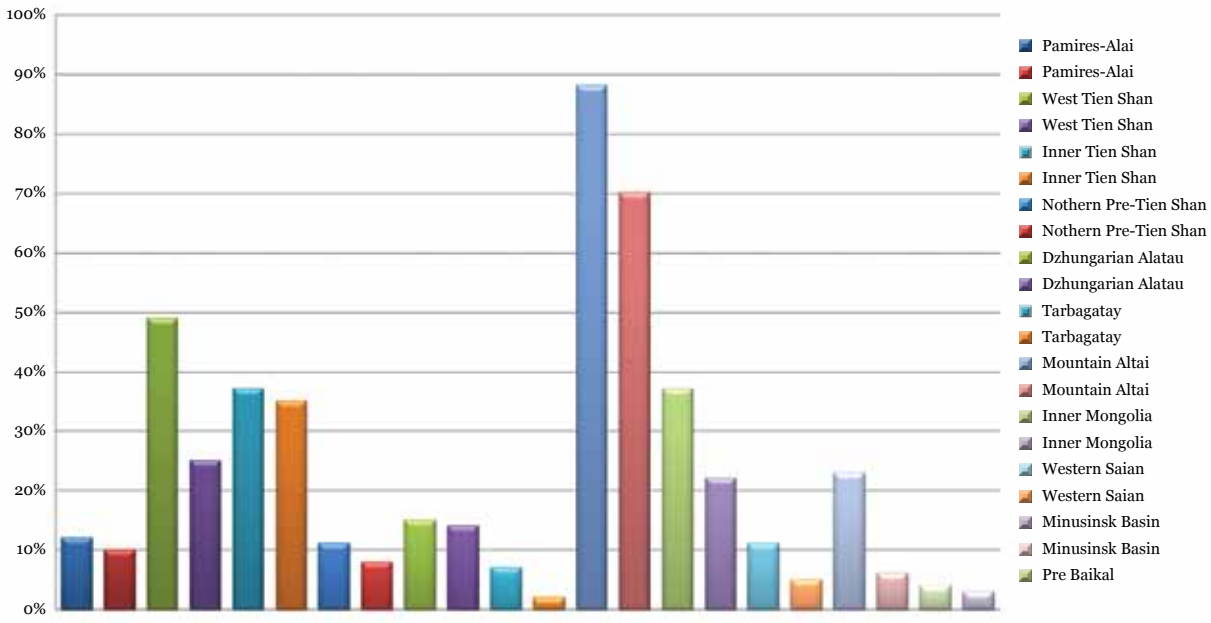
Vehicles with driver (right bar) and ratio with all vehicles (left bar)



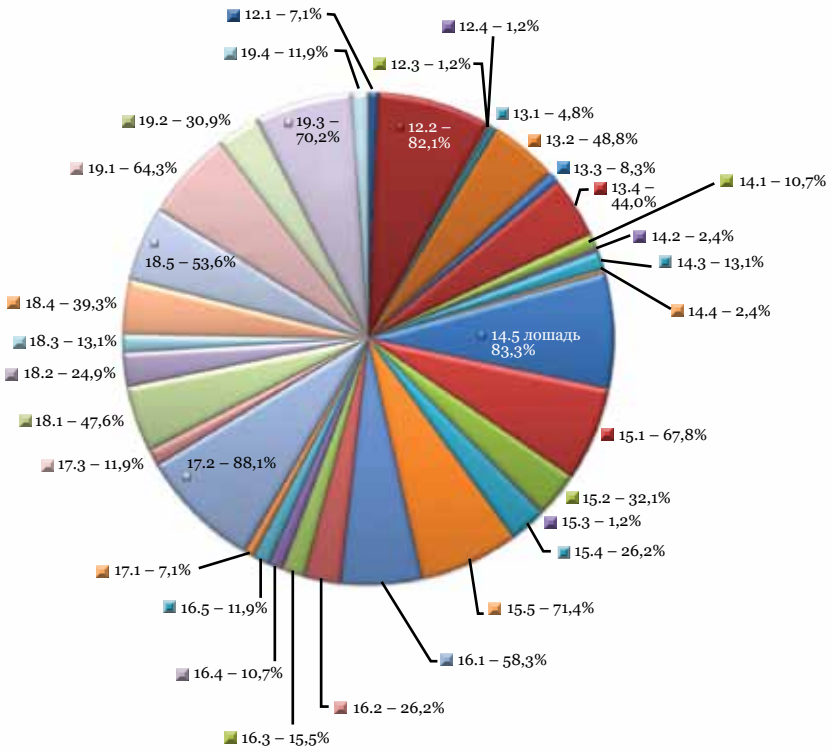
Vehicles and gigs with driver. Features with all regions



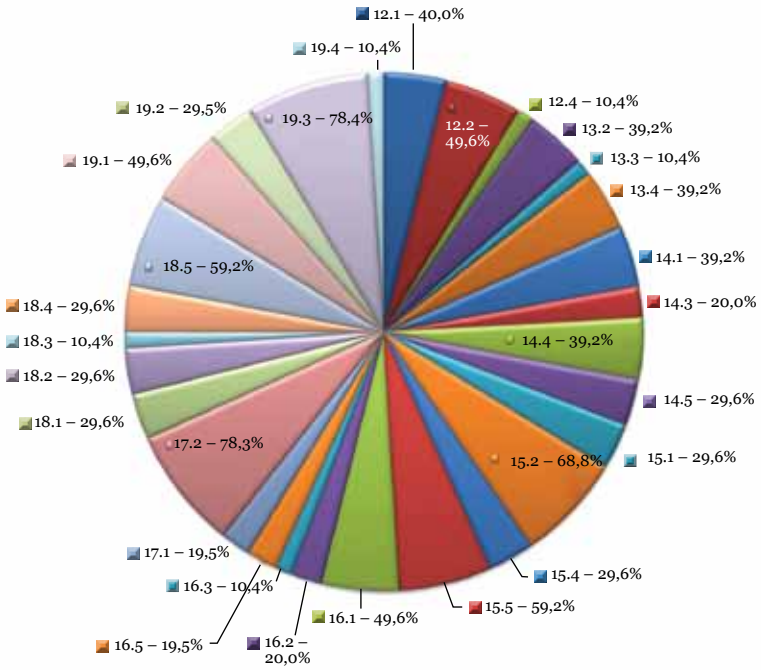
Ratio drived vehicles (right bar) and all vehicles in regions (left bar)



Gigs and chariots. Draught animals



Wagons. Draught animals



Description of image 2.2. Ar 13

General information:	
Subject:	Vehicle
Region:	Karatau
State:	Kazakhstan
New details:	No
Racurs:	Plan
Direction:	6
Renovations:	No
Damages:	No
Monument:	Arpauzen 5
N of plate:	42
Part of composition:	Yes
Scale:	10.0
Technique:	Beaten
Construction:	
Type of vehicle:	Chariot
Type of wheel:	Spokes
Covered:	No
Platform:	Contour
Shape of platform:	Round
Axle:	Unclear
Type of harness:	Draught-pole
Draught-pole:	Courved, With top
With yoke-saddles:	No
With cross-beam:	No
Details of bridle:	Unclear
Driver:	
Legs:	Bended, Step, Straddled
Hands:	Up, Straight
Head:	Silhouette
Body:	Silhouette, Rectangular
Animals:	
Quantity of animals in team:	2
Quantity of legs:	4.4
Half – bred team:	No
Kind of draught animals:	Horse
Legs of animals:	EI – BM crossed up, EI – BM crossed down, Legs titled forward, EI – BM is parallel
Tail:	Long
Way of realization:	Silhouette
Head:	Rectangular, Long, Triangular
Body:	Massive, With the waist
Features:	
Features of construction:	Wheels is bigger the box, Size of wheels is different
Position of driver:	Are shown in «profile», Stand on the vehicle,
Details of animals:	Ears, Phallus, Mane
Source:	
Author(s):	Kadyrbaev M.K., Mariashev A.N.
Title:	Naskalnye izobrazhenia khrebta Karatau
Printing house:	Nauka, Alma Ata
Date of Publication:	1977
N of page:	122
N of illustration:	72
Language:	Russian

Описание изображения 2.2.Ко4

Общее описание:	
Предмет изображения:	Повозка
Географический регион:	Каратау
Административная единица:	Юж. Казахстан
Новые детали:	Нет
Ракурс:	План
Направление изображения:	5
Подновления:	Нет
Повреждения:	Нет
Название памятника:	Койбагар 1
Номер плоскости:	125
Часть композиции:	Да
Масштаб:	5.0
Техника:	Выбивка
Конструкция:	
Тип повозки:	Колесница
Тип колеса:	Спицы
Крытая повозка?:	Нет
Площадка:	Контур
Форма площадки:	Округлая
Положение площадки:	Над осью
Ось:	Короткая
Способ запряжки:	Дышло
Дышло:	Прямое
Показаны яр. рогатки:	Да
Показана пер. дышла:	Да
Литература:	
Автор публикации:	Кадырбаев М.К., Марьяшев А.Н.
Название работы:	Наскальные изображения хребта Каратау
Издательство:	Наука, Алма-Ата
Дата публикации:	1977
№ страницы:	45
№ иллюстрации:	16
Язык текста:	Русский

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1.2.	Western Pamires-Alai	7	1
1.3.	Karakorum	1	1
1.4.	Peninsula Hindustan	6	6
2.	Western Tien Shan	65	50
2.1.	Talas chain	5	4
2.2.	Chain Karatau	60	46
3.	Internal Tien Shan	37	37
3.1.	Fergana chain	37	37
4.	Northern Pre-Tien Shan	14	11
4.1.	Chu-Ili mountains	8	5
4.2.	Kazakh Melkosopochnik	6	6
5.	Dzhungarian Alatau	15	15
5.1.	Valley of Koksu	15	15
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6.1.	Tarbagatai	7	7
6.2.	Mountain Altai	95	90
6.3.	Mongolian Altai	44	35
6.4.	Internal Mongolia	5	2
6.5.	Western Saian	11	11
6.6.	Khakass-Minusinsk Basin	29	23
7.	The rock art images from other regions	4	4
8.	Caucasus	82	78
8.1.	Northern Pre-Black Sea	5	5
8.2.	Transcaucasus	77	73
9.	Meditterranean	29	29
9.1.	Greece	5	5
9.2.	Northern Alpes	15	15
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List of monuments.

Index	Monument	Quantity of images	
		Fixed	Discribed
1.1.Ak1-5	Akdzhilga	5	3
1.2.TT1	Tekke Tash	1	1
1.2.Oh1	Okhna	1	-
1.2.Ka1-5	Karakiasai	5	-
1.3.Th1	Tkhor	1	1
1.4.CN1	Chibbarnala	1	1
1.4.Dh1	Dkharampuri	1	1
1.4.CB1-3	Chatur Bkhu Nash	3	3
1.4.Ek1	Eda Kalkave	1	1
2.1.Zt1-4	Zhaltyryk Tash	4	4
2.1.Tr1	Tars	1	-
2.2.Ko1-28	Koibagar I, II, III	28	20
2.2.Ar1-22	Arpausen I, III, IV, V, VI	22	18
2.2.KA1-4	Koshkar Ata I, II	4	2
2.2.Ga1	Gabaevka	1	1
2.2.Kb1	Kokbulak	1	1
2.2.Ks1-3	Ksan	3	3
2.2.Rg1	Rang Ozen	1	1
3.1.ST1-37	Saimaly Tash	37	37
4.1.Tg1-6	Tamgaly	6	3
4.1.Cm1-2	Chumysh	2	2
4.2.Dz1	Dzhambul	1	1
4.2.Kt1	Kesteletas	1	1
4.2.Bk1-3	Baikonour III	3	3
4.2.Sk1	Saiak	1	1
5.1.EO1-15	Eshkiolmes	15	15
6.1.Ak1	Akbaur	1	1
6.1.Ku1	Kurchum	1	1
6.1.Mo1-2	Moinak	2	2
6.1.Ty1-2	Tyilkune	2	2
6.1.Sa1	Saur Tarbagatai	1	1
6.2.KT1-5	Kalbak Tash	5	2
6.2.Zg1	Zhalgyz Tepe	1	1

List of monuments.

Index	Monument	Quantity of images	
		Fixed	Discribed
6.2.El1-86	Elangash	87	86
6.2.Ah1	Adyr Khan	1	-
6.2.Nd1	Undocumented	1	1
6.3.YU1-4	Yiamany Us	4	4
6.3.Ts1-3	Tsagan Gol	3	3
6.3.BA1-2	Bichigty Am	2	2
6.3.HS1-3	Khovd Somon	3	2
6.3.BS1	Bagar Somon	1	1
6.3.Cu1-20	Chulut	20	12
6.3.DS1	Darvi Somon	1	1
6.3.MS1	Manlai Somon	1	1
6.3.Ha1	Havtsgait	1	1
6.3.Nd1-8	Undocumented	8	8
6.4.Ur1	Urad	1	1
6.4.Ys1-4	Yiangsu	4	1
6.5.SC1	Syyn Churek	1	1
6.5.MC1-5	Mugur Sargol-Chinge	5	5
6.5.RT1	Road of Chingizkhan	1	1
6.5.OS1-4	Orta Sargol	4	4
6.6.UT1	Ust Tuba	1	1
6.6.SK1-3	Shaman Kamen (Oglakhty)	3	-
6.6.Su1	Sukhanikha II	1	1
6.6.Th1-4	Tunchukh	4	4
6.6.Os1	Oshkolskaia pisanitsa	1	1
6.6.Se1-7	Sedlovina	7	5
6.6.Sk1-2	Shishka	2	2
6.6.Po1-2	Polosataia	2	2
6.6.Zn1	Znamenka	1	1
6.6.As1	Askiz	1	1
6.6.UB1	Ust Byiur	1	1
6.6.Rz1	Razliv X	1	-
6.6.KK1	Krasnyi Kamen	1	1
6.6.SB1	Severnyi bereg Varchi	1	1

List of monuments.

Index	Monument	Quantity of images	
		Fixed	Discribed
6.6.HH1	Khara Khaia	1	1
6.6.Ut1	Uibat	1	1
7.1.Sl1	Sulek	1	1
7.1.CS	Chana Shulun	1	1
7.1.TO1-2	Tabangutskoe Obo	2	2
8.1.KM1-4	Kamenaia Mogila	4	4
8.1.TA1	Tash Air	1	1
8.2.Go1	Gobustan	1	1
8.2.Ge1	Gemigaia	5	1
8.2.Sy1-70	Syinik	70	70
8.2.Be1	Berekei	1	1
9.1.Kv1	Kavala	1	1
9.1.Av1-2	Avdon	2	2
9.1.My1	Mycen	1	1
9.1.En1	Encomi	1	1
9.2.Cm1-11	Valcamonica	11	11
9.2.Tr1	Toreion del Rubio	1	1
9.2.KB1	Kabeza de Baie	1	1
9.2.Pe1	Penalsordo	1	1
9.2.Nd1	Undocumented	1	1
9.3.Ts1-7	Tassili	7	7
9.3.Sh1-2	Sakhara	2	2
10.Fr1-19	Frannarp	19	16
10.Bo1-6	Bottna	6	6
10.Sv1-2	Svennebi	2	2
10.KV1-3	Kville	3	3
10.Ki1	Kivik	1	1
10.Of1-10	Ostfold	10	10
10.Vi1	Vitkau	1	1
10.Dr1	Darslub	1	1
10.Bh1-3	Bohuslan	3	3
10.Si1-2	Simris	2	2
10.Og1-2	Ostergotland	2	2

The list of attributes and indexes.

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1.3. Paintings
1.4. Are shown in «plan»
1.5. Are shown in «profile»

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2.3. With spokes

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3.1. Covered
3.2. Are shown as countour
3.3. Are shown as silhouette
3.4. D-frame
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3.7. Rectangular
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3.10. Emplacement before the axle
3.11. Emplacement above the axle

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4.5. Unclear

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6. Draught-pole
6.1. A-frame
6.2. Curved
6.3. Composite
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Group II. Driver.

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9.3. Absent
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13.1. One
13.2. Two
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14.1. Half-bred (mixing) team
14.2. Goat (arkhar)
14.3. Ox
14.4. Camel
14.5. Horse

15. Legs of animals
15.1. EI-BM crossed up
15.2. EI-BM crossed down
15.3. Legs bended to body
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17.3. Line

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20.2. Type of wheels is different
20.3. Number of spoks in wheels is different
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21. Position of driver.
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24. Detailes of draught animals.
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24.2. Projection on withers
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24.4. Hoofs
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24.8. Phallus
24.9. Mane

The Catalog of Eurasian's engravings of vehicles.

1. Alai Pamirs.

1.1. Mountaineous Badakhshan. As a result of researches by V. Ranov and A. Gursky 48 sites of petroglyphs were located and put on the map. The greatest amount of petroglyphes is considered to be near village Liangar-Kisht, in the middle current of river Gunt, in the Vybyst-Dara gorge [Ranov, Gursky, 1966, p. 111]. The main part of images can be referred to the end of the Bronze Age, the period of early nomads and the Middle Ages. Figures of Mesolitic Era detected in the grotto Shakhty. [Phormozov, 1969, p. 72].

Akdzhilga. Hundreds of images, including figures of archers, elongated images of horses, horse riders and mountain goats were found here on the northern slope of the Alichur mountain chain, to the right of the river bank at a height of 3800 metres above the sea level. Images in Scythian animal style were located. Five images of chariots with drivers behind them were found in the petroglyphs of Akdzhilga. This picture shows three human figures with open hands. All these drawings were done using the graffity technic [Zhukov, Ranov, 1972, p. 540-541; 1974, p. 62-68]. 1.1Ak1-3. (*).

1.2. Western Alai Pamirs. The region is less investigated, than Mountaineous Badakhshan. There are such large monuments as Zaraut-Kamar, Sarmysh and others [Shatsky, 1973]. More than 30 complexes with the rock art images are situated in this region [Sher, 1980, p. 85-95; Oskin, 1976, p. 83-89].

Tekke-Tash. A number of petroglyphs were discovered in one of the offshoots of the Hissar mountain chain – Karategin, in the valley of river Surkhob, between villages of Shilbili and Oksoi. Images on the rocks here appear to follow a terrace-like partern. Single images of mountain goats, human beings and damaged images of chariots were found. [Mandelshtam, 1961, p. 86, fig. 4]. 1.2.TT1.

Okhna stretches from the northern offshoots of the Alai chain mountains to the north of village Okhna. M.E. Voronets marks the figures of «arba (cart) with arbakesh (a driver)» in this region. [Voronets, 1950, p. 81; Shatsky, 1973, p. 68].The latest information about 130 monuments of rock engravings located in the foothill areas of the Alai chain mountains in Uzbekistan.

Karakiasay. 90 stones with 1015 separate figures and compositions were found here. Among these images are arkhars (mountain goat), camels, horses, dogs, bulls, wolfs, horseriders, and 5 chariots, four of which are harnessed by horses. [Khuzhanazarov, 1990, p. 116-122].

1.3. Karakorum. The petroglyphs of Northern Pakistan caught the sight of man in connection with construction of the highway in 1974-1978. Seven large sites of petroglyphs were discovered at a height of 2 500-3 500 metres above the sea level, near the confluence of river Gilgit and river Indus at the following places: Khunza-Khaldekisht, Chilaz I-II, Tkhor, Khodar, Talpan, at bridge Shatial and at bridge Alam, in districts Minar-ga and Khodar, near the ancient city Khunza.

Chineese written sources testify the fact that man was well acquainted with these places which were reffered to as a part of the caravan road from Tarimbek to

(*) Index of these images can be found in a computer data bank. Composition: serial numbers of geographical regions, letter code of monuments and serial number of charriot engravings. The computer data bank contains detailed description of each indexed image.

Southern Asia. Their learnings shows that this mountaineous part of caravan road belonged to the ancient State of Bolore, which was well patronized by palmers and travellers. They would engrave designed words of praises to express their gratitude. These clues triggered off the curiosity of both professor K.Jettmar of Heidelberg university (Germany) and professor Dani of Hislamabad university (Pakistan) to undertake a thorough study of this territory with the aim of clarifying the routes of the caravan road using the engravings on the rocks. [Jettmar 1980, p. 185-221; 1980- 1982; 1983, p. 22-32; 1984; Dani 1983].

The results surpassed the most courageous expectations. Almost 1450 compositions and 4 000 separate figures, including about 500 inscriptions, were found in Chilaz alone. Scenes from Buddist legends were copied. Plenty of images of mountain goats, other animals, hunters, warriors and etc were discovered here. Ancient images of bulls and demonic entities with masks on their faces, similar to those of Okunevo were found. Separate groups of these engravings constitute images of deers in a traditional Scythian-Siberean animal style. Based on the endless number of rock engravings found in these regions, one can boldly conclude that most of the ancient petroglyphs of Northern Pakistan were created by the immigrants from the steppe regions of Asia [Jettmar 1980; 1983; Dani 1983].

This concept is supported by the fact that the engravings and the carvings found here differ from those discovered in the region of the Indonistanian Peninsula, where rock art is represented in overwhelming majority by paintings. It is no wonder that figures of carriages have been found among the petroglyphs.

Tkhor. Petroglyphs engraved on the rocks of the northern bank of Indus-river are the same as those in the settlements nearby. The picture on the rock depicts a chariot harnessed by two horses with a man shooting an arrow behind it. Apart from that, quite a number of images about Buddhism, part of which conforms to the «A»-shaped carriages. [Jettmar 1980, p. 203, 214, fig 1]. (fig. 11:1). Such bull driven carriages which feature frequently in the petroglyphs of the Mediteranean and the Caucasses are located at Dekane.

1.4. Hindustanian Peninsula. More than twenty regions on the territory of modern India contain hundreds of drawings. Generally these figures are concentrated in the grottos. Fifteen of such regions are situated in Northern India, and five in the Southern and Central parts of the country. On the whole about a hundred of monuments of rock art present in India. Colours like red, green, white, black and others were generally used in these drawings. [Brooks, Wakankar, 1976, p. 1-32, append.].

Analysis of Indian creative tradition is based on matching the images on the rocks to the figures on ceramics and weapons found in the archaeological monuments. Historians come to the conclution that there exist about twenty different creative styles of these drawings that can be related to the five historical periods.

The first six styles are reffered to the Stone age, dated as far as 8000-2500 B.C.; the seventh style through the tenth belong to the Bronze Age, dated 500-300 B.C. [Brooks, Wakankar, 1976, p 31-32].

There are images of carriages (fig. 12) found and published by a group of contributors from Craz, Austria. [GE.FE.BI.1977/78, s. 28,30,54; 1981/82, s. 89].

Chibbarnala. Northern India. Figures found in two grottos. Amidst the images of a chariot, harnessed by a pair of horses with a driver, ther are figures of people with axes in thier hands. 1.4.CN1.

Dharampuri. Northern India. Single images of chariots with two drivers, harnessed by a pair of horses, were located in three grottos. 1.4.Dh1.3 images of chariots which are harnessed by animals were found in grotto Chatur Bhu Nash. Coventional symbols were used to denote the drivers and the animals. Few images of vehicles were discovered in grotto Eda Kalkave.

2. Western Tien Shan.

This region entails the spurs of the Talas chain mountains Ugamsky, Pskemsky, Kuraminsky, Chatkalsky, mountains Mogoltau, and also the western and the southern offshoots of the two mountain chains, Talas Alatau and Karatau respectively. About 20 monuments with petroglyphs are present here. Among them are such large ones as Karatau, Aksu Dhzabagly (Kaskabulak), including 2-3 thousand compositions and separate images.

2.1. The Talas chain mountains. Zhaltyryk Tash (Ur Maral). Some engravings were discovered on the huge block of granite on the coast of river Ur Maral, where river Talas flows left into the Kamansu gorge. [Gaponenko, 1963, p. 102-109].

Researchers have come across unique images such as a series of large «Scythian panthers», fantastic figures of dragons, dogs, engravings of «kentaurus», shooting an arrow from a bow, alongside with popular Central Asian images of mountain goats, deers and camels. On a separate plate there are few images of chariots amidst different signs. [Sher, Miklashevich, Samashev, Sovetova, 1987, p. 70-78, fig. 3] 2.1.Zt1-4.

Tars. Various rock art images on a massive plate can be seen on the left coast of the same river near Dzhambul. The brightest among them are figures of people and animals. These compositions are engraved in the background of some figures of animals. On separate small plate there is a figure of two knifes with tabs on holders. The image of a chariot can be seen here.

(2.1.Tr1, fig. 5-6). This monument was discovered and studied by Z. Samashev and B. Piatkin, the author of the review in 1989.

2.2. Chain Karatau. Numerous groups of petroglyphs were discovered on the southern and northern slopes of moutain chain to north-west from Dzhambul. These groups are concentrated in gorges on the northern slope of Koibagar mountain chains, Arpauzen, Koshkar Ata, Kokbulak and others; on the southern slopes of Maidamtal, Besaryk and others. The largest groups of petroglyphs on the southern slope include more than 3000 compositions and separate images, which are practically a replica of the images, found in the engravings of Central Asia.

The works of I. Kastanie [1910] present us with an insight into the Karatau petroglyphs. Thanks to the works of M. Kadyrbaev and A. Mariashev in the seventies understanding these petroglyphs came closer. [Kadyrbaev, Mariashev, 1973, 1977].

It is worth studying the images of single and double axle carriages drawn by horses and camels among the numerous image compositions of people, animals, signs. On the whole, 54 images present here. (fig. 7-8).

The petroglyphs in Koibagar which are situated on the three hills have been divided into three main groups. 10 images of carriages are in group I, 3 in group II, and 14 in group III. Out of the 2779 figures of Koibagar the share of vehicles makes up 0,9 %. The images were made in combinations. The dot beat technic is the most widely used, then carving and patina smoothing by initially sectoring outlines of the figures. The patinization level of these images is Pt 45.

Koibagar I. A plate with carriage engravings on it was found on the southern and eastern slopes of a hill. The drawings are mainly presented in single images. Only in two cases (stones 71, 215) images of chariots are combined with figures like bullsturs, horses, camels, mountain goats, dogs and human.

Stone 17, 120 X 90 (*). A single image of a chariot (2.2K01).

Stone 20, 120 X 140 A single image of a chariot (2.2K02).

Stone 71, 120 X100. A chariot with an ox beside it and a horse below it.(37X23). The picture shows a horse on top of a circle with a camel beneath it and a mountain goat on the right of the circle. (2.2K03).

Stone 125, 75 x 72, two images of a chariot, the second one is incomplete with some images of mountain goats and unintelligible signs to the far right (2.2K04; 2.2K05).

Stone 158, 80 X 50. An unfinished image of a chariot (2.2K06).

Stone 215, 115 X 45. A single image of a chariot without draught animals. Below on the right on a plate is a figure of a dog, on the left there are schematical images of a human and a goat (2.2K07).

Stone 231, 120 X 60 A single image of a chariot and two horse as draught animals (2.2K08).

Stone 247. An image of a chariot harnessed by schematically shown animals, above there is a mountain goat (2.2K09).

Stone 251, 85 X 65. A poorly saved single image of a chariot with the front part destroyed (2.2K010).

Koibagar II. Two images of vehicles, one obviously incomplete (stone 200). The plates are located on the eastern and western slopes of a hill. The patinizationlevel is Pt -4-5.

Stone 22, 120 X 100. A chariot harnessed by two camels, above and below – four camels and an unfinished image (2.2K011).

Stone 141, 50 X 135.A chariot, harnessed by two horses, below- an image of a mountain goat (2.2 K012).

Stone 200. Two wheels joined by a line (2.2K013).

Koibagar III. Most of the 14 discoveries are concentrated on the south-eastern slope of the hill. The level of patinization of these images is Pt 4-5.

Stone 148, 170X120. A poorly saved chariot, two camels, two goats, and seven unintelligible signs (Pt-4) which are out of consonance with a human with a gun making the whole thing blur and unreadable (Pt-1), (2.2K014).

Stone 200, 100X100. A destroyed image of a chariot,with part of a draught horse and a carriage clearly seen. (2.2K015).

Stone 213, 125X80. A profile image showing the silhouette of a carriage with a camel as the draught animal with an archer in the carriage. Below and above are figures of two people (2.2K016).

Stone 239, 40 X 40. A single image of a chariot, draught by two horses (2.2K017).

Stone 281, 100X70. A chariot with the draught animals destroyed (2.2K018).

Stone 295, 100x40 A three strata scene: lower layer (Pt-5) depicts two horses, three camels, seven mountain goats, rider on a horse, a chariot with some thing unintelligibleby it. The second layer (Pt-3) shows two human figures and a goat. Top layer (Pt-3) shows three riders on camels and kulan. (2.2K019).

Stone 435, 80 X 50.A single image in a form of a chariot.(2.2K020).

Stone 438, 69 X 69.A single image of a chariot.

Stone 452, 115 X 63. An image showing a horse and a wagon. The sign. Above depicts an incomplete image of a chariot.

(*) Sizes of plates are given in cm

Stone 475, 80 X 40. A human figure with a camel draught chariot.

Stone 485, 85 X 45. A desroyed single image of a chariot draught by two horses with preserved wheels and part of the platform. (2.2Ko25).

Stone 522, 86 X 88. An image of a wagon with an indistinct figure of an animal above it. (2.2Ko26).

Stone 527, 150 X 100. A desroyed plate with an image of a chariot and rider on a horse and 8 figures of goats (2.2Ko27).

Stone 528, 88 X 71. A multiple composition with some vague figures of people, goats and dogs at the top. At the bottom, there is a human figure and a chariot fastened with two horses. A more attentive look reveals the person holding the bridle in one hand and trying to pull the chariot towards him with the other hand. Far to the right are a driver and a dog (2.2Ko28).

The petroglyphs of Arpauzen are situated on the distance of 30 kms north-west from Koibagar on plain slate plates. 8 groups of petroglyphs were discovered here, each of which contains from 39 up to 249 plates with figures. The animal world is widely represented, sacral scenes and solar signs are relatively scan. Majority of the drawings were dot beaten by initially setting the margings of the figure. Only a small fraction of these images were made in graffiti. A total number, 20 vehicles were found here, ten of them harnessed by horses, two by camels, and others without draught animals or with damaged ones. The patinization level of these images is Pt-4-5. These images constitute only 0,9% of the 3401 known ones.

Arpauzen I. Plate 110. An image of a chariot draught by a pair of horses. On the left there is a figure of a mountain goat (2.2.Ar1).

Arpauzen III. Plate 59, 90 X 45. A single image of a wagon with camels as draught animals (2.2.Ar3).

Plate 101, 500 X 500. The picture here depicts a chariot, a driver, two horses amidst five dogs, goats, and some unintelligible images of animals. Below there is an archer. (2.2Ar4).

Plate 111, 50 X 35. A camel harnessed wagon with a human being holding the bridle. (2.2.Ar5).

Plate 185 120 X 60. Two images of chariots. The one on the left side is fastened to a horse, whilst the one on the right is damaged (2.2.Ar6-7).

Plate 199, 150 X 45. A cart and a chariot above it, a sign to the right and a dog beneath it. (2.2.Ar8-9).

Plate 213, 150 X 100. A single image of a chariot draught by two horses (2.2.Ar10).

Plate 241, 200 X 40. An image with a bear in the center, two riders on horses above, a camel, a bit further up, a chariot below, a human with open hands on the left and a camel closing the left side. (2.2.Ar11).

Arpauzen IV. The plate 33, 30 X 50. An incomplete image of a chariot, a camel and higher – human (?).

Arpauzen V. Plate 42. 100 X 100. The central part of almost horizontal plate of rock is occupied with three chariots, each of them fastened to a double horse team. In one of the chariot ther is an archer shooting a goat. The figure of the archer in the chariot on the left is destroyed beyond recognition. Below the is an image of the third chariot with a couchman. On the right side, at a level of a chariot with an archer there is a partially saved figure of a man throwing cord with a loop in the direction of a mountain goat. The image on the left side depicts a predator. Above there is a destroyed image of a cart. (2.2.Ar12-15).

Plate64, 120 X 80. A chariot, a figure of a horse. It happened that one horse was engraved on the other. This makes it difficult to see all the features of the first one. (Pt-2), (2.2.Ar17).

Plate 80, 120 X 110. A carriage draught by a pair of horses (2.2.Ar18).

Arpauzen VI. Plate 51, 200 X 120. A complex engraving showing four men, a goat, two dogs, two camels and some unintelligible figures. The whole composition from right to left resembles a chariot without draught animals (2.2.Ar19).

Arpauzen VIII. Plate 8, 600 X 800. The image here shows indistinct figures of animals, two goats. Below there are seven goats, six men and two horses. The central figures overlap the images of 28 horses, six camels, three goats and certain unintelligible signs (Pt-1). Further to the right there is a damaged image of a chariot. (Pt-4), (2.2.Ar20).

Plate 47, 80 X 60. A horse fastened to a carriage.

Plate 80, 100 X 100. A goat, a camel, a damaged image of a vehicle and bulls with phalluses. Above there is human figure on a separate fragment of a plate.

Koshkar-Ata. Petroglyphs engraved on rocks and fine fragments of slate showing figures of goats, camels, horses and mainly single images which are located at a distance of 21 kms westward group I at Koibagar. Three cases of vehicles engraved on stones found here. The patinization level here is Pt 4-5.

Koshkar-Ata I. Plate 31, 115 X 110. A chariot draught by two horses. Below there are two geometrical signs. (2.2.KA1).

Plate 61, 120 X 110. A person with his hands high in the air in a cart draught by horses. Beside there are two mountain goats (2.2.KA2).

Plate 66, 150 x 100. A chariot, a pair of horses, amidst six goats and a man (2.2.KA3).

Koshkar-Ata II. Archeologists and historians mentioned finding images of chariots.

The petroglyphs of Gabaevka are located as high as 1324 metres above the sea level, to the south-east of the Karatau chain of mountains. There are some figures of animals engraved on the shale plates as well as complex compositions.

Plate 62, 160 X 150. There are two wavy lines above along side with figures of bulls. On top left there are three figures of animals particularly bulls. In the center there is a camel, two mountain goats, a bull and a man. Beneath that are two goats and a chariot draught by a horse. Below there are four mountain goats. (2.2Ga1).

Figures of vehicles found likewise in Kokbulak. (2.2Kb1); Ksan (2.2Ks1-3); a Rang ozen (2.2ro1).

3. Tien Shan.

Covers the eastern edges of the Khirgiz chain of mountains, the north–west offshoots of the Fergana and the Susamyr chain of mountains. Saimaly Tash is considered the most famous among the five discovered here monuments with the rock art images.

3.1. Saimaly Tash. The Fergana chain, the Kugart pass. Many thousands of rock art images discovered at a height of more than 3000 meters above the sea level, in a small valley with a small lake, on top of the pass and on the slopes of nearby mountains, mainly on boulders and fragments of plates. These petroglyphs became known early this century. [Khludov, 1902; Poslavsky, 1903].

B. Zima studied the eastern group of monuments in 1946. [Zima, 1947, 1958]. The first full scale research of Saimaly Tash took place in 1950 by A. Bernshtam. The common pattern that prevails in the topography served as the basis on which A. Bernshtam made his hypothesis about part of stones being moved from their original positions during a tectonic

movement of the earthquake that might have happened in the beginning of 1000 B.C. A. Bernshtam was the first person to come out with a scheme which is used to classify the styles and plots of a given complex. [Bernshtam, 1952].

In 1963 N. Podolsky undertook studies of these petroglyphs. [1966], in 1966 -1968. – Y. Golendukhin [1971], in 1968 – 1973 – G. Pomaskina [1969, 1970, 1972, 1974, 1975, 1976]. In 1977 – 1978; the field operations on Saimaly Tash were carried by J. Sher [1980, p. 105-111].

Since the middle of the 80's, A. Martynov and A. Mariashev engaged in the series of systematic researches. [Martynov, Mariashev, Abetekov, 1992]. In the summer of 1985, the author of the review examined and recorded the main groups of petroglyphs.

The so-called «bitriangular» figures such as solar and cult are easily recognised among the others. Images of vehicles were discovered mainly in Saimaly Tash I (according to Bernshtam), as well as in the southern part – Saimaly Tash II, and in groups closer to the Kugart pass. (fig. 9-10).

Absence of monographically issued materials of these monuments makes it virtually impossible to carry out any meaningful description of plates with petroglyphs. In all, 37 (3.1.ST1-37) images of vehicles were found here. Obviously, their number is more significant.

4. Northern Pre-Tien Shan.

Surrounds of the Chu-Ili mountain chains, Altyn-Emel, Chulak mountain, Koiandytau mountains, northern slopes of the Zaili mountain chain. More than 30 monuments of rock art are known here. Among them there are large ones like Tamgaly, Chumysh, Kulzhabasy and others.

4.1. Tamgaly. The Chu-Ili mountains. A whole number of petroglyphs found on schist rocks in the Anrakhai mountains, a hundred and sixty kilometres north-west from Almaty. They are as usually concentrated in the gorges where it is possible to come accross the famous «sunhead» images on altar. These petroglyphs became known for the first time after the A. Maksimova's publications [1958, p. 108-110].

In the beginning of the 80's, a group of archaeologists from Almaty worked and published the main plots and descriptions of these petroglyphs. [Maksimova, Ermolaeva, Mariashev, 1985]. The author of the review repeatedly studied and copied the petroglyphs of Tamgaly, participated in excavations of Alacul (Andronovo) sepulchres with Bronze Age petroglyphs at the foothill of the rocks. Series of researches are being carried out under the leadership of A.E.Rogozhinsky with the aim of fixing all the images here.

A total number of six images of vehicles have been discovered in the petroglyphs of Tamgaly, 2 of which (a chariot and a wagon) have been published. (fig. 11: 4-5), 4.1Tg1-3.

These petroglyphs are located in the same gorge. The main group (2000 figures) are concentrated in the lower and midle parts.

The petroglyphs in group III look like two or three level building, the lower level contains the most interesting images, such as archers, and god of the sun standing on a bull, and a chariot.

Group V. Plate53, 150 x 170. Pt-4. Above there is a figure of two mountain goats, a man, a horse which overlaps the image that was drawn earlier. Below is a figure of a horse rider, a mountain goat, a horse, a camel, a man, a chariot, a dog and a rectangle.

Gorge 2, hill 8. Plate 40, 70 X 70. Pt-3-4. A chariot, draught horses partially blocked by the images of 3 mountain goats.

Plate17, 160 x 100. Pt-4. A chariot, draught by horses with a damaged figure of a man, above is an image of a human foot, two figures of animals and a person with open hands (4.1Tg1) [Maksimova, Ermolaeva, Mariashev, 1985, p. 8, 123-140; Rogozhinsky, 2004;2011].

Chumysh. South-western spurs of the Chu-Ili mountains, at a distance about 25 kms north-east of Bishkek. Rock art images located in several places on the southern slopes of the mountains. More than 10 groups of petroglyphs are present in the Chumish region. There are several thousands of them in total. Almost all of the images of rock art known in Central Asia are represented here. Studying these monuments, A. Mariashev discovered two images of chariots. 4.1Cm1-2 (fig. 11:2-3).

4.2. The Kazakh Melkosopochnik. Surrounds a large part of the steppe and semi-desert areas of Kazakhstan, north-west slops of the Chu-Ili mountains, North and South of Balkhash region. In the ancient world this region was refered to as Sary Arka (the yellow turning mountain chain). For a long time the petroglyphs of this steppe part of Asia, were not studied. Except for V. Gorodtsov's article which is devoted to the Baikonour complex of petroglyphs [1926, p. 37-67]. It wasn't until the middle of the 40's that A. Margulan led an expedition team to explore the antiquities of this territory [Margulan, 1947, 1948, 1979].

In the 60's and 70`s, A. Medoev, geologist, compiled a manuscript on the rock art of Balkhash region. [1979]. Since the beginning the 80's, the author of this book, and the leader of the Sary Arka expedition team, comprising of a group of experts from the Karaganda university, left no stone unturned in order to come out with meaningful explanation of these monuments and petroglyphs of this region. [Novozhenov, 1987, p. 79-89; 1989, p. 110-122; 1990, p. 130-136, 2002].

More than 20 monuments with petroglyphs were found on the banks of small steppe rivers, on rocks, and on tops of slopes of hills. Scenes of hunting, animals struggling and striving for their life, and compositions of erotic characters were found alongside with the numerous single images of animals such as mountain goats, horses, camels and others. Three monuments with images of vehicles can seen in the petroglyphs.

Dzhambul. Petroglyphs were found in the same mountains which serve as continuation of the north-west spurs of the Chu-Ili mountains, in the valley of river Aimakhan-chokho, south-west of Balkhash. These rock art images were detected by I. Lubianykh in 1936. In the course of time, they were inspected by an expedition team under the leadership of A. Margulan in 1948. Then they were later examined and partially copied by A. Medoev [1979, pp. 157-158, 163-164]. Images of bulls, mountain goats, dogs, and boars were found in the petroglyphs, one of which depicts images of horseriders, camels and others.

On a tilted plate there are some engravings of a chariot without draught animals (4.2Dz1). The picture below shows three horses standing tail to tail to each other. The size of a plate is 0,46 X 0,32 metres.

Kesteletas. Petroglyphs were discovered at a distance of 22 kms north-north-west of Beibitshelic, a village in the Karkaraly region of the Karaganda district, on the southern slope, on well patinized boulders. Images of animals, mountain goats, camels, horses, boars, people, and solar signs which were done by dot beat and patina smoothing combination were found on 24 stones.

Boulder 5, 0, 9 X 0, 7 m. A single image of a chariot without draught animals (4.2.Kt1). Below there is an unintelligible figure.

Baikonour. Two massive plates with images of vehicles found on both banks of the same river at a distance of 200 kms west of Dzhezkazgan on separate rocks in group of petroglyphs at Baikonour III.

Plate 2, 8 X 1,2 m. Some engravings found on a slightly inclined plate with abundance of lichens. On the left there is an archer with a «tail» and a dog chasing a bull, awild horse, a camel, a mountain goat, horses, predators and others. On the right side there are horses, two humans, a mountain goat, antilopes, camel and a wagon draught by two camels. (4.2Bk1). Beside there is a group of nine persons, a horse with reins, which are connected to a figure of a dog. A little bit further there are three dogs, a human holding on to the reins a horse, and a wagon with a driver drauhgt by a pair of horses, one of which is destroyed by a knock. (4.2Bk2). Above there are figures of three horses, two dogs, a bull, with figures of five horses, a camel and a bear below (fig. 13).

Plate 17, 2,1 X 0,9 m. A slightly inclined plate situated in the north-western part of the group with images drawn in a combination of patina smoothing, graffity and dot beaten. The following images are: a dog, a boar, four camels, a horse, a dog, a human with camels. Below there is a figure of a woman and two semicircle signs. On the right part of a plate there is an image of a human with a horse, two persons, a horse, some semi-circle signs, figure of two bulls, (one is destroyed), an archer, two horses, (one of which has a rider engraved on it), a cart draught by a pair of camels (4.2Bk3). A camel completes the descriptioin of the picture. (fig. 14).

Sayak is the term used to describe location of petroglyphs in the northern part of Balkhash on the Besobinsk plains, in the Karaugur and the Itmurundi mountains and in the Sayak, Kalmakzhaktan and Karashat valeys. Figures of bulls, deers, mountain goats, boars, predators are found.

5. Dzhungarian Alatau

The Dzhungarian Alatau chain of mountains stretches in a meridional direction, linking to the spurs of Tien Shan with the south-western slopes of the Saian-Altai mountains. Up till now we know very little about the petroglyphs of this region. There are over 50 monuments here. [AKK, p. 32-33].

5.1. Eshkiolmes. The valleys of river Koksu. A few groups of petroglyphs found on the southern slopes of the Dzhungarian chain of mountains on the right river bank, opposite village Talapty. These petroglyphes were discovered and studied by N. Pantusov. [1900, p. 26-28; 1901, p. 347-348]. Since the beginning of 80's the petroglyphs of Eshkiolmes were studied by expedition team under the leadership of A. Mariashev. [Mariashev, Rogozhinsky, 1991]. In 1982-85 the author participated in recording the petroglyphs and undertook excavations of sepulchres of the Bronze Age at the foothills of the rocks with engravings.

The petroglyphs of Eshkiolmes appear rather diverse both in contents and style. A few images of vehicles discovered among thousands of single figures.(fig. 15, append. 3, 5.1E01- 2).

6. Saian-Altai.

The Saian-Altai mountain-steppe region is one of the richest provinces in Asia in terms of rock art images. A lot of «Stone galleries» stretching tens of kilometers discovered here. Several thousands of figures were copied from the rock. There are about 50 complexes in Eastern Kazakhstan, more than 20 in Mongolia, and over 40 monuments with petroglyphs found in Tuva.

This region has hundreds images of vehicles. There are numerous literature sources on rock art images of the Saian-Altai region, Mongolia [Novgorodova, 1989, p. 140-143], Yenisei [Leontiev, 1980] and East Kazakhstan [Samashev, 1981, p. 69-70, 1992; 1993].

6.1. Tarbagatai, river Irtysh (fig. 17, append.3). The territory of East Kazakhstan was a zone of long active contacts between ancient cultures of the north-east boarders of Central Asia and south-western part of Southern Siberia and Mongolia.The data on available from rock art images proves this fact. [Sher, 1980, p. 122]. Thanks to the researches undertaken by S. Chernikov and Z. Samashev, numerous petroglyphs of this region became known to experts.

Akbaur. A painted grotto with more than 80 figures on the walls and ceiling found near lake Zaisan, about 1 km from the coast of river Urankhai, on the southern slope of the same hill. (Append. 3). On the wall opposite the entrance, in the center of picture there are inverted figures of a goat and a draught cart, in the midst of numerous figures of crosses, oblique figures, zigzags, broken lines, circles, squares with points, «houses», antrophomorph figures and vague images [Samashev, 1990, p. 123-129, fig. 1-3]. (6.1Ak1).

There are some images of vehicles in the groups of petroglyphs on the north-west slops of Tarbagatai and the Kalby chain mountains in upper part of river Irtysh, in Tulkune, Moinak, Kurchum and Okei. (fig. 17) [Samashev, 1981, p. 70, fig. 1; 1992]. (6.1Ku1-2; 6.1Ty1-2; 6.1Mo1; 6.1Sa1).

6.2. Mountaineous Altai. According to V. Kubarev, more than 30 large groups of rock art images are present in the south-eastern and central regions of this area. Among them are Elangash, Kalbak Tash, Kok uzek, where thousands of the images were unearthed, Bichikty Bom, Buraty, and others, with hundreds of petroglyphs. [Kubarev, 1990, p. 154; Kubarev, Matochkin, 1992].

Kalbak Tash. There is a monument with over two thousand images on the right to the bank of river Chui, 18 km from village Inia. Two images of chariots are shown on one of the plates. (fig. 18: 9; append.3). In front of them there is a group of the animals, two horses and two mountain goats can be recognized among them. Images of vehicles, as well as figure of women, man's phallus, image of hands, bulls, warriors, human, fantastic predators, deers etc. dated as the Bronze age. [Kubarev, 1990, p. 154-157, fig. 1] (6.2KT1-2).

Elangash. Behind the pass of the Chui chain of mountains is the valley of the river Dzhazator and tableland Ukok. Here, along the western chain of Soilugem was the most convenient short road from Mongolia to China, which was used until recently. River Elangash springs from the glaciers in the spurs of the Chui chain of mountains. Many thousands of the rock art images, beaten on boulders and rocks were found in the river valley which is about 18 km in length. [Okladnikov and others, 1979, p. 7-8].

From 1969 to 1975, these petroglyphs were copied using tracing paper by a group of contributors under the direction of academician A. Okladnikov and were published in series of monographs. [Okladnikov, Okladnikova, Zaporozhskaia, Skorynina, 1979; 1980; 1981; 1982; Okladnikov, Okladnikova, 1985].

That was the first time in the historiography when an attempt was made to fully publish the petroglyphs of a particular monument, with the aim of using them in further researches. On the whole, 16 sites with petroglyphs on the left coast of the river were studied, 5 sites on the right with some of them containing as much as 3500 images.

It is known that some petroglyphs are concentrated in the gorges of Sary Satak, Chankyr Kel`, Kyzyl Kel`. The author believes that the earliest petroglyphs are situated at the waterfall. The main images in these compositions are exellently drawn figures of bulls and people. This group of petroglyphs represents the original «altar», around which all new images were made. A collection of images of vehicles, which is the largest in Central Asia was found in the valley of river Elangash. (fig. 18-23).

Site I. The river bank. (fig. 18). Boulder 19. Above there are two carts draught by horses, with drivers and three unintelligible figures. Below there are the images of three dogs attacking some mountain goats and some unintelligible figures (6.2El1-2).

Boulder 28. In the left part there are figures of five bulls pulling a cargo with three persons, two unreadable images and a cart without a draught-pole. On the right part there is a chariot with a driver and two draught horses. Above are figures of a bull and a horse. (6.2El3).

Boulder 32. On the left part there are two bulls and an unintelligible figure of an animal. The right part shows a chariot, two horses, a driver and a certain figure (6.2El4).

Boulder 34. A picture of a wagon interfered by two horses, with a driver and a chariot with a pair of horses. (6.2El5-6).

Boulder 35. In center there are two deers and six unintelligible figures. From right to left there are single images of chariots with drivers. A vehicle on the left surrounded by three unreadable figures. Below there are two unintelligible images. (6.2El7-8).

Boulder 36. Image of a cart draught by horses with a driver, and two figures of dogs (?) (6.2El9).

Boulder 38. A mountain goat above, three horses and a chariot with a driver and two horses below. (6.2El10).

Boulder 39. Above there is a chariot with understandable images of draught animals. Below are an archer, some deers, dogs, mountain goats, and a horse-rider. There are 27 figures in all on this boulder. (6.2El11).

Site III (fig. 23-24). Boulder 2a. Four figures of animals and a person, above two continuous disks (6.2El12).

Boulder 3. A chariot, two horses. Below there is a mountain goat and two unintelligible figures (6.2El13).

Boulder 4. A cart with some unreadable images as draught animals, a driver, a mountain goat and three unintelligible animals (6.2El14).

Boulder 11. In the center there are two large figures of bulls with packs on their backs; above is an archer, six mountain goats, a predator, seven not understandable figures and a horse. Below there are two persons, two mountain goats, a boar, a dog, five unintelligible figures of some animals, a two horse chariot without a driver (6.2El15).

Boulder 12. A chariot with a driver. Mountain goats and deers (6.2El16).

Plates 15a-b-c are located above each other.

Rock 15a. A chariot with a driver and two horses, above there is deer with a bull beside it, mountain goats, figures of certain animals. Below there is a cart draught by two horses, a bull, mountain goats, a figure of a predator and other dull figures. (6.2El17- 18).

Rock 15b. The figures on this plate are three storied. The one on the top shows two horses, an archer, a dog, uncertain figures, cart, pair of horses, driver. The second circle: five mountain goats, a chariot, driver, bower shoots mountain goats, uncertain animals. The third circle: a chariot, driver, horse, deers, dog, camel, mountain goats (6.2El19-21).

Rock 15c. Above there is a chariot, two horses, a driver, two bulls (one reined), mountain goats, and dull figures. Below are two carts draught by horses, a large figure of a deer, which probably overlaps the images of a smaller one, a mountain goat, inside a large deer – two figures of the animals, above a deer – chariot, two horses, a driver, further on there are three images of carts draught by horses, (two – with drivers, one schematical), a mountain goat, dogs, some unintelligible figures of animals. On the plate there are images of two wheels with a line between them. (6.2El22-28).

Boulder 19. Above there are three images of chariots draught by horses with drivers (one of the chariots is not completed). Below there is a figure of a bull, mountain goats and certain animals (6.2El29-31).

Boulder 20. A single image of a chariot with two horses and driver, shown schematically (6.2El32).

Boulder 26. A chariot with a driver with a whip in his hand and two horses. Beside there is a mountain goat and certain animals (6.2El33).

Boulder 27a. The picture above depicts some unintelligible figures of animals. Below there is chariot draught by horses, with two drivers. Beside are figures of bulls, snakes a predator and some dull figures. Much below there are images of bulls, people, a horserider, dogs attacking a mountain goat, a bull and some other figures. (6.2El34).

Boulder 27b. Above there is an image of a cart with a driver and two horses, a mountain goat, a dog, a horse, bulls (one of them reined), a person with spear. Below there is a chariot, a driver with a spear, a mountain goat, a person with a bull and two unintelligible figures of some animals. (6.2El35- 36).

Boulder 27c. A horse, a bull, a mountain goat, some dull figures of animals. Below there is a cart with two drivers, a mountain goat, a horse, and some vague figures (6.2El37).

Stone 64. A single image of a cart without draught animals. (6.2El38).

Stone 73. A cart with a driver with some vague figures (6.2El39).

A boulder without number. A cart, a horse, (the second draught animal not readable), a mountain goat and four vague figures (6.2El40).

Site IV. Stone 12. A deer, two wheels with a line between, uncertan figures (6.2El41).

Stone 13. Three chariots (two – with drivers), a semi-circle sign (6.2El42-44).

Stone 14. A chariot, two horses, a schematically shown driver, silhouette of certain animals. (6.2El45).

Site V. Stone 9. A mountain goat, a horse, certain animals, a chariot, two horses, a driver, a solar sign as a circle with a cross in it. (6.2El46).

Stone 10. A cart, a horse and some vague-figures. (6.2El47).

Stone 45a-b. A chariot and a driver. In place of the draught animals are mountain goats and horses. Below there is a person with a dog, and some vague figures. (6.2El48).

Stone 90. Graffity of a chariot with two horses, a driver, a bull and another horse on the left. (6.2El49).

Stone 117. A cart without draught animals.(6.2El50).

Stone 119. A single image of a cart (6.2El51).

Stone 153. Mountain goats, deer, two chariots, one with two drivers (6.2El52-53).

Stone 286. A cart, a mountain goat andsome vague figures.

Stone 336b. A deer, a cart, mountain-goats, and some unintelligible figures.

Stone 337. Two persons, a deer, some unreadable figures, mountain goats, a horse, a chariot, a person holding something. (6.2El56).

Stone 356. An animal with a cargo on its back, two deers, a mountain goat and a solar sign, some vague figures, graffity of a chariot with a driver without draught animals. (6.2El 57).

Site VIII. (fig. 25). Stone 31b. A chariot, two horses, a driver, a mountain goat, and an antilope. (6.2El58).

Site IX. (fig. 25-26). Stone 16. Two wheels, and some vague graffity lines. (6.2El59).

Stone 38e. Vague figures, mountain goats, a cart and two horses. (6.2El60).

Stone 98. Dogs, mountain goats, some animals, cart, two horses, mountain goats, and a man. (6.2El61).

Stone 153a. A horse, mountain goats, vague figures, chariot without draught animals.(6.2El62).

Stone 155. An indistinct image of a chariot.

Stone 157a. A mountain goat, a vague figure and vehicle (6.2El64).

Stone 157b. A mountain goat, a deer, avague figure, a cart without draught animals. (6.2El65).

Stone 183a. Large figures of a bull and a deer, mountain goats indistinct figures, a chariot, two horses, a driver, a cart, draught by two horses, a chariot with driver and two horses. (6.2El66-68).

Stone 217a. A bull,vague figures, mountain goats, sheep, deers, a cart. (6.2El69).

Site X. (fig. 23). Stone 9. Mountain goats, a bird, horse-riders, a horse, deers, a dog, a cart. (6.2El70).

Site XI. Stone 115. A person with 2 horses, a chariot without draught animals. (6.2El71).

Site XII. (fig. 22-23). Stone 29. A single image of a cart. (6.2El72).

Stone 38. A mountain goat, vague figures of certain animals, a person with a bull and vague figures. (6.2El73).

Stone 251. A mountain goat, a chariot (6.2El74).

Stone 262. A chariot, draught by two animals, wolfs, dogs, mountain goats, an antilope, vague signs. (6.2El75).

Stone 1022. A cart draught by two horses, two mountain goats. (6.2El76).

Site XIII. (fig. 23). Stone 54. A single image of a chariot without draught animals. (6.2El77).

Stone 935. A horserider, a mountain goat, two images of carts, draught by bulls. A vehicle with a driver, a horserider in front of a cart. (6.2El78-79).

Site XIV. (fig. 23). Stone 23. A cart, a chariot draught by horses, round figures, a cart. (6.2El80-81).

Stone 755. On the left there are four antrophomorph figures, a mountain goat, an indistinct figure of an animal. In center is a cart with a driver and two horses.(6.2El82).

Stone 940. A desroyed image of a chariot,a driver, certain unintelligible figures of animals. (6.2El83).

Stone 3313. A number of carts joined together, another cart, a horse, signs (6.2El84).

Site XV. (fig. 23). A stone 401. A cart without draught animals, a dog, a mountain goat, vague figures. (6.2El85).

Stone 476. A cart, a mountain goat, a vague figure. (6.2El86).

Site XYI. Stone 272. A silhouette of a cart and a certain animal. (6.2El87).

6.3. Mongolian and Gobi Altai. The beginning of a scientific reseach into the petroglyphs of Mongolia was sparked off by a group of Soviet-Mongolian archaeological expeditions. [Okladnikov, 1972; Volkov, 1965; Dordzh, Novgorodova, 1975]. This group fixed a lot of monuments of rock art. Several projects of the studying and under-

standing of mongolian rock art plots with vehicles have appeared. [Novgorodova, 1989, p. 140-165]. At the moment, more than 50 images of vehicles are known in the Mongolian Altai mountains, and over 30 on the bank of river Chulut. [Novgorodova, 1989, p.142]. (fig. 24-26).

Yiamany Us. The Mongolian Altai spurs, mountain Khanyn Khad, four images of vehicles were found here among petroglyphs of different age groups. A three horse chariot engraved on a segmented large plate at height about 8 or 9 m. (6.3Yu1) coupled with a figure of an archer and a battle scene of two warriors on the same segmented rock. Further to the right there is a second chariot, a lighter image of a crew of horseriders posed in a typical Sunnu's era style. Below there is a figure of a mountain goat. Proceeding further on to the right there is one more up right image of a chariot which is different from the previous ones. It is harnesed to a four horse team with a driver. There are numerous figures of horses around the chariot. (6.3Yu2-4).

Opposite to this plate in gorge Yiamahy Us there is a fourth image of a chariot executed schematically [Novgorodova, 1971, p. 49; 1989, p. 143-144].

Tsagan Gol. Slops of Mongolian Altai. Gobialtai aimak, on the left coast of the same river, in a crevice of a rock, at height more than 3 metres there are three chariots (the largest one is 27 X 15 cm, and the smallest, 10 X 7,6 cm). All chariots shown without draught animals. Other numerous images found in the Tsagan Gol gorge. [Dorzh, Novgorodova, 1975, p. 20-21; Novgorodova, 1989, p. 142-143].

Bichigtyn Am. (Bichigt Khad). Mongolian Altai. Baiankhongor aimak. A cart draught by a pair of horses with a driver in the midst of archers, deers with horns, a dog, and a mountain goat were found in the depth of the gorge on in the low mountains. (6.3BA1). [Dorzh, Novgorodova, 1975, p. 145]. There are incomplete data about other images of vehicles (6.3BA2). [Ser-Odzhav, 1987, p. 131].

Geologists report that images of two-wheel and four-wheel vehicles were found in Baiankhongor aimak. [Lauer, 1972].

Khobd Somon. The southern spurs of Mongolian Altai, Uvsanur aimak, the Tabsh Uul mountains. There is an image of a vehicle draught by four horses engraved on a dark block. (6.3hS1). This particular image, which in literature is reffered as «Gobian Quadrig», is the first one found in Mongolian petroglyphs of vehicles. [Okladnikov, 1964, p. 208-211; Kozhin, 1968; Dorzh, Novgorodova, 1978; 1989, p. 142-148]. To the left of the vehicle there is a person posing as an archer. Below there is the image of «Gobian Quadrig» represented obviously as two chariots in one. Similar types of chariots are known in the petroglyphs of Yenisei and Scandinavia. At a distance of 500 metres from this plate there is the Tabsh mountain with the second chariot (quadrig), shown without draught animals. (6.3hS2). The third vehicle is draught by apair of horses. [Novgorodova, 1989, p. 146- 148].

Bagar Somon. A few images of chariots. [Novgorodova, 1984, p. 80, fig. 26]. A composition with a cart in the midst of three mountain goats and a certain vague figure. (fig. 24:1).

Chulut. The Khangai spurs. Northern Mongolia, the same river valley. (6.3Cu1-12; fig. 25).

Group Chulut I. Stone 2. Large figures of two animals, two archers, an erotic scene, mountain goats, a dog and a vehicle.

Stone 40. A chariot, two horses and two figures of deers, engraved in front of a vehicle. The figures of draught horses erased and altered into figures of deers.

Stone 60. Two carts, an indistinct figure, silhouette of a horse and a mountain goat, shown in front of a vehicle. Below there are two indistinct figures probably a deer and a dog.

A Separate stone.260 X 190 cm. At a distance of 80m north from stone 60 is a double strata composition. Two carts draught by horses, one looking more as a vehicle than a cart, amidst figures of horses, mountain goats and a dog. The image above the cart is blocked by a late figure of sheep.

Stone 62, 63 X 50 cm. An image of a cart draught by a pair of horses with driver. Beside there is a large snake, a mountain goat and a deer above.

Stone 68. A large horizontal block tilted towards with a line running accross its surface and dividing it into two equal halves. On both halves there are numerous images of animals such as stallions, mountain goats, deers, and three vehicles. The first cart is without draught animals, only some fragments of the second cart can be seen, the third cart with a round platform is draught by a pair of horses. There is an archer shooting a deer, beside there is a figure of a mountain goat [Novgorodova, 1984, p. 66-73, fig. 32, 21-23; 1989, p. 148-156].

Tashgait. The Mongolian Altai spurs. At a distance of 20 kms east from vilage Khokhmorit of Gobialtai aimak there are numerous rocks covered with black and dark brown patina. Images of various historical periods can be seen here. Images of all sorts of animals and people in a wave-like nature engraved on these rocks. These images include mountain goats, deers and horses. These petroglyphs were examined by the author in summer 1992 during UNESCO expedition on the territory of Mongolia. Two images were found in the course of these expeditions.

The first image depicts a cart with a sketch showing the wheels in a scheduled projection. The driver can be seen standing at ease on the platform. The draught animals are not shown in details. Quite apart from that, the reins are shown. The cart is harnessed by a four horse team. There is a mountain goat in front of the cart. Below there is a vague stain. The composition is made using the patina smoothing technology in a combination with rare dot beats.

Another image of a vehicle in a composition seen at a distance of 20 metres down the slope of a hill (fig. 26). The plate of 1,1 X 0,7 metres in size, and oriented south-east was probably destroyed by continuous knocking. The following images can be seen on this plate; two horses, two joint antrophomorph figures, an indistinct stain, a zoomorphic image, an archer with «an animal tail», and a chariot with driver. Above the figure of the chariot there is a mountain goat, an indistict figure of an animal, two horses, a bull marked with a stain, and a horse. The horse mane is shown in hatchings, the legs are shown together, and the head is destroyed by the breakage of the plate.

At the bottom of the plate there are figures of mountain goats and certain animals with some lines running between them. The mountain goats are standing face to face to each other, a horse rider with a horse. Taking a closer look at the picture, it is not difficult to guess that the horse was drawn using the patina smoothing technic. Besides, there are some figures of animals and an antrophomorphic figure with stains.

The basis of the described composition lies in the chariot draught by three horses: two of them as radicals and the third one as trace. The represented horses have their manes deepened for a reason or two, with some thick spheres shown at the end of the tails and legs. This serves as a differential factor for the petroglyphs of Mountain

Altai. There is a detailed construction of a vehicle, spokes in wheels, a cross-beam of a draught-pole, belts of a trace horse with reins. A D-frame platform. The driver as well as the vehicle is shown in a scheduled projection. The driver standing on the platform with his hands lowered together with the reins. The driver's fingers can be vividly seen. There is a short beam erecting from the driver's head.

All these figures were drawn using the patina smoothing technic. There are no traces of dot beats. Analysis of colour spectrum shows that some figures on this plate were made later.

6.4. Inner Mongolia. Monuments with petroglyphs were found in the northern part of modern China, on Chinese Mongolia. On over fifty complexes are present in China. [Chen Zhao-fu, 1988].

Urad (fig. 27:1). Petroglyphs found in the valley of mountains Yiangshan and Lanshan, on the territory of China, Internal Mongolia. Within plates of all sorts of animal images, there is a plate with an archer shooting a horse, two mountain goats and a chariot (6.4Ur1) with a pair of draught animals. On the other plate there is an image of a composite disk wheel. [Chen Zhao-fu, 1988, p. 193, 196, fig. 31, 33].

A large plate with circles and solar signs was found in the south-east province of Tsziangsu, in Lianyiangan district, on the Yellow sea coast. Schematical images of four carts without draught animals were found here. (fig.27:2). Draught-poles, solid wheels of a small diameter, yoke-saddles are shown. [Chen Zhao-fu, 1988, p. 210, fig. 41].

6.5. Western Saian. The petroglyphs of Tuva are rather known in the literature [Grach, 1957; 1958; 1979; Vainshtein, 1975; Sher, 1980; Davlet, 1976; 1980; 1982; 1990; and other]. 11 images of vehicles were used as basic plots for the chronology clssification of the whole array of the rock art images of the Bronze Age upper Yenisei[Davlet, 1982, p. 22-31].

Syyn Churek. About 300 figures of people, animals, signs and chariots were found in the Northern slops the western Tannu ola chain mountains a distance of about 20 km south-west of village Shagonar. (6.5SC1). [Vainshtein, 1975, p. 8-9].

Mugur Sargol-Chinge. The beginning of the Saian canyon of Yenisei, the confluence of river Yenisei and river Chinge. A total number of eight to nine thousand rock art images are present here. Studiyng of these monument began in 1966 by A. Grach and A. Phormozov and was continued by J. Sher and M. Davlet, M. Kilunovskaya. [Grach, 1957, p. 125; 1958, p. 55; Phormozov, 1967; 1969, p. 104-107; Vainshtein, 1975; Davlet, 1975, p. 238-248; 1976; 1980; 1982; Sher, 1980; Kilunovskaya, 2011], (fig. 29; append.3).

The boulder numbered 281 was found near the so-called «altar» part of a monument, at some distance from the coast. According to M. Davlet, the images on this stone were put down later. The boulder is in a form of a rock with a crack dividing it into two halves. The left part – depicts figures of deers, mountain goats and vague images. The right part shows two chariots without draught animals. (6.5MC1-2), a sketch of «houses» and vague figures. [Davlet, 1980,p. 58, 203-204]. At the spring of river Chinge, on theright and left coast there are three images (fig. 29: 13,15).

Stone 52 – single image of a chariot (6.5MC3).

Stone without number – two wheels with spokes, pair of horses, a horse-rider. (?), (6.5MC4).

Stone without number – chariot, a pair of horses with spheres on the ends of their tails, a good and clear detailed construction. (6.5MC5). [Davlet, 1976, p. 29, tab. 39- 3, 44-4; 1982, p. 25, fig. 8].

The «Chingizkhan» Road. This conditional was name given to the mysterious and fortificated road complex which meanders tens of kilometers through the mountain slopes of the Saian canyon at Yenisei, north-west of Tuva. There are rock art images of various historical periods on rocks and separately lying stones. A plate with images of six mountain goats surrounding a cart, a bull, a horse, a square sign and certain indistinct figures found in the Terezenik Buuk district, near the fortificated structure, «the Chingizkhan road». (fig. 29:1), [Davlet, 1982, p. 27, 32, fig. 8-2, tab. 1-1].

Ortaa Sargol. A groups of petroglyphs, occuring at different times found on the slopes of the same gorge, that separates the Yenisei canyon from the mountain ridge, near the «Chingizkhan road» and Mugur Sargol.

On a separate plate there are engravings of scores of mountain goats, two deers, an antrophomorphic figure and a cart without draught animals. A probable image of a vehicle, two figures of mountain goats interferring each other. (6.50S1). On two broken plates there are fragments of images of two chariots, one of which is shown in a combination with some unintelligible signs and figures of two mountain goats. On a separate plate there is an image of a chariot with yoke-saddles. (fig. 29: 2-5, 7, 8,10). [Davlet, 1982, p. 34-35, tab. 1-2; 2-1, 2; 3-1].

6.6. The Khakass-Minusinsk Basin. There are some contradictory hypotheses concerning the occurrences of petroglyphs, traditionally reffered to as the pisanitsa. There are various versions on these issues in numerous publications which up till now has never become food for thought. In connection with the construction of the Krasnoyarsk man-made lake, Institute of archaeology (Moscow) carried out a thorough research of monuments with rock art on the Yenisei coast and the surrounding territories. Countles numbers of materials have been gathered as the result of the research which are yet to be interpreted. The images of vehicles along the great river valley are considered in a number of publications [Leontiev, 1980, p. 65-84; Sevastianova, 1980, p. 103-107; Davlet, 1982, p. 22-31; Sher, 1980], (fig. 30).

Tepsei. This region entails the confluence of river Yenisei and river Tuba, the same surrounding mountains and slopes. We shall be considering ten main congestions of petroglyphs here. (Tepsei I-IV; Ust Tuba I-VI). [Sher, 1980, p. 146-153]. A large number of Ust Tuba I-VI petroglyphs stretching 6 kms, which A. Adrianov mentioned and found on the southern slope of the mountains and coastal hills, which are flooded today by the man-made lake. [1904, p. 28].

In group Ust Tuba II, on western circle of rocks the reare 14 plates with 76 images elks, bulls, solar signs and a cart above with an a antrophomorphic figure. (6.6uT1). [Sher, 1980, fig. 76-4].

The Oglakhty pisanitsa covers the rocks of south-eastern and south-western slopes of mountain Oglakhty the left coast of Yenisei opposite river Tuba. Several images which belong to different age groups found in this region. Historians have it that there are four large groups of petroglyphs with more than 700 images and compositions present here. Separate images of monuments repeatedly published on this issue. [Spassky, 1818, p. 149; Savenkov, 1910, p. 64-65; Appelgren-Kivalo, 1931; Viatkina, 1961, p. 193; Sher, 1980, p. 154-158]. Among the Oglakhty petroglyphs are unique images of Karasuk knifes as well as vehicles. [Piatkin, 1979, p. 126-129].

The Shaman Rock. The discovery of that massive horizontal plate by B. Piatkin [1977; 1979 p.126-129], and the copies of petroglyphs made by H. Miclashevich re-

veals three images of chariots and carts, shown without draught animals among sets of various figures of animals, circles and others. Today, fragments of those copies by V. Kapelko can be seen as exposition in Abakan museum.

Sukhanikha. Four groups of petroglyphs were found on the coast of Yenisei, a distance of 12 km above the spring of river Tuba, on the western slope of mountain Sukhanikha. [Sher, 1980, p. 141-142]. The petroglyphs of Sukhanikha which consist of hundreds of compositions were discovered by A. Adrianov. [Adrianov, 1904, p. 28].

Images of animals, people, Tashtuk horseriders, a cart draught by a pair of horses belong to different classes, taking age as the criterium for classification, to have been seen on small rocks on the southern slope of the mountain, in group Sukhanikha II. (6.6Su1), [Leontiev, 1980, p. 76, fig. 4-3].

Mountain Tunchukh. The petroglyphs are located on rocks at a distance of 4 kms south-west of village Askiz. On a narrow plate of grey sandstone, 8m in length there are figures of deers, people, with lengthened proportions of their bodies, mountain goats and three vehicles. Petroglyphs were strongly efflorescenced in order to survive fragmentary. One part of the plate depicts images of three vehicles: a cart and two wagons, one of which is shown «schematically», whilst the others are shown «in a profile». (6.6Th1-4). Beside there is a figure of a mountain goat, a dog or a wolf, small circles, a person with his hands in the air and some unintelligible images. Near these vehicles there is one more image of a wagon, which is probably part of the Okunev mask. The vehicle is similar to that of Ust Tuba. [Sevastianova, 1980, p. 103-107; see: Esin, 2011].

Mountain Sedlovina. (fig. 30). According to archeologists there are five images of chariots with a-frame draught-poles in the midst of several animals, two carts and a few wheels, on a small rock found in the Maidashinsk mountain range, near vilage Bystraia,. (6.6Se1-4), [Leontiev, 1980, p. 78-79, fig. 5-6]. There is an image of two chariots, (6.6Se5) a deer and a man on a separate broken plate. The person figure and the back part of a vehicle are damaged. [Sevastianiva, 1980, p. 104-105]. A similar image is found on a horizontal plate with schematical figures of people on the adjacent mountain by name Shishka. (6.6Sk1).

All vehicles in the vicinity of village Bystraia are represented without draught animals, or shown separately. (6.6Sk2). Two images of carts were found on rocks in the Minusinsk Basin and published by N.Leontiev. The one found on the slopes of mountain Polosataia is damaged by the cracks on the plate. At the same time, an uncompleted figure engraved on the picture in question makes the whole thing blur. (6.6Po1). The cart (6.6Po2) draught by a pair of horses on the other hand is only represented schematically. [Leontiev, 1980, p. 75, fig. 4-2].

7. Rock engravings of vehicles of other regions.

The petroglyphs of the taiga zone in Asia became known to mankind thanks to A. Okladnikov's expeditions. [Okladnikov, Zaporozhskaya, 1969; 1970; 1972; Okladnikov, 1971]. Rock art images found here differ from those in the petroglyphs in the other parts of Asia. [Davlet, 1988, p. 54-83].This is obviously due to the differences in traditions and customs. Rock engravings of vehicles of most ancient historical periods, which coincide with that of Okunevo or Karasuk cultures, are not represented here. Graffity of more mordern vehicles are found on the coast of river Chulym, where it joins river Ob in the Kara Ulus distrist of mountain Sulek. (7.1Sl1) [Ksica, 1974,

s.41,fig.E-4]. Graffity of vehicles are reported to have been discovered on the banks of river Selenga in the Chana Shuluun and Tabangut Obo districts. (7.1CS1-3), [Ksica, 1974, s. 52].

Images of vehicles on rocks are known and in other parts of the Eurasian continent: in the Caucasus, Greece; Italy and Sakhara; in Sweden and in Norway. Images in these regions are better investigated as by virtue of a combining their exact dating by using axes, knifes, etc., (thus these tool were thought to give rather exact dating), and by virtue of long and systematic archaeological researches on these territories.

Specification of these data was boosted by the availability of numerous models of vehicles, elements of the devices used in harnessing of the chariot, and the nature of vehicles. Now, there is a criterium for the classifications of vehicles engraved on rocks in the Caucasus, Scandinavia and Italy. These circumstances allow them to serve as the foundation upon which we can stand and expand the structure accepted in the given review and pay more attention to the styles and typology of these images.

8. The Caucasus.

The term Caucasus which is metaphorically used here does not apply only to the Caucasus mountains, but also to the territory of Transcaucasus and its closely related regions.

8.1. The Northern Black Sea District. Kamenaia Mogila, near Melitopol. Images of three vehicles, a chariot, with a wheel and a trapezoidal body on it, (plate 27) and a sketch showing a team of oxen with slege and carts (8.1KM1-4) were found here [Cherednichenko, 1976, p. 138, fig. 4-2].

8.2. Transcaucasus. Gobustan is located between the south-east spurs of the Large Caucasus chain of mountains and the Caspian sea. The petroglyphs are concentrated in groups on the slopes of mountains Beyikdash, Kichikdash, Dzhingirdag and Yiazyly Tepe. More than 4000 images, inscriptions and signs found on 700 rocks and separate boulders. Images of bulls, goats, horses, dogs, women, archers and others as well as groups of painted images, were found here (okhra). [Muradova, Rustamov, 1986].

Yiazyly Tepe. Stone 55. A single image of A-frame chariot without draught animals (8.2Go1), [Dzhafarzade, 1973; Muradova, Rustamov, 1986, p. 8-25].

Gemigaia is the mythological name given to the highest mountain of the Small Caucasus chain mountains otherwise reffered to as Kapydzhik, situated a distance of 60 kms north of Ordubad. On the southern slope, at height of 3 500-3 700 metres above the sea level, there are over a thousand rock art images of people, deers, bulls, mountain goats, dogs, fantastic animals and various compositions: hunting scenes, ritual dancing and others. On one of plates there are four engraved images of carts draught by animals (8.2Ge1). [Aliev, 1985, p. 3-15, fig. 16].

Syinik. The Gegamsky mountains. A few thousands plates, with obvious age difference between them, containing more than 70 images exist in the Ukhtasar and Dzhermadzhur districts, approximately 30 kms from vilage Sisan, at a height of 3 300 metres above the sea level. [Karakhanian, Saphian, 1970]. There are large accumulations of petroglyphs as well as images of vehicles in vicinity of the cones at small and large Paitasar, Ziart, Sheikhi, Chingil and others. [Martirosian, 1981].

Based on the analysis of both available images of vehicles in tombs on this territory, St. Piggott came out with a definite classification of the Syinik petroglyphs. (fig. 40). [Piggott, 1983, page 78-83, fig. 7]:

The same sledge draught by bulls shown without wheels, similar to the engraving on the rocks in Penalsordo district (Spain) and

in the Fontanalba valley (Ligurian Alpes), engraved on some rocks at Kamenaia Mogila. (8.2Sy1-6).

The four types of wagons are:

- rectangular body, on large disk wheels (8.2Sy7-19).

- rectangular body, on large wheels with spokes (8.2Sy20).

- rectangular body, on very small disk wheels (8.2Sy21-44).

- A-frame wagons on disk wheels (8.2Sy41,45).

Three types of carts:

- rectangular body, on disk wheels (8.2Sy46-51).

- A- shaped frame on disk wheels (8.2Sy53-54).

- A- shaped frame on wheels with spokes (8.2Sy52).

Selected chariots are considered in a special bulletin. (8.2Sy55-64) [Littauer, 1977, p. 243-262, fig. 1-7, with the notes: Piggott, 1983, p. 103-104]. Images 8.2Sy 65-70 are out of classification.

9. The Meditterranean.

9.1. Greece. In Kavala region and the slopes of mountain Pagaion there are different figures of horse-riders, taking age as the means of classification, graffity of dogs, deers, archers. There exist a lot of images alongside with the various signs, including solar ones. On one site there is an engraving showing a boat and an image of vehicles. Apparently, it is a three A-frame chariots joined together. (9.1Kv1). Under them there are four foot prints. [Ataktidis, 1988, p. 16-24], (fig. 35:1).

9.2. Italy. Valcamonica (fig. 35:2; 36). Many thousands of rock art images of different historical periods were found here. Already several decades here and leaving no stone unturned employees of the Center of antiquities studies under the leadership of Professor E. Anati unveiled these petroglyphs to a wide public. Historians and archeologists were able to differentiate and put under various classes the existing group of petroglyphs in Valcamonica.

Two-wheels chariot without draught animals (9.2Cm1) engraved on a separate plate. Behind the vehicle there is a figure of a person with his hands hanging loose by his sides. Beside there is a circle with a point in the center and a certain figure. [Anati, 1960, p. 53, fig.6]. On the other plate there is a cart (9.2Cm2) draught by a pair of horses, in the midst of circles and people standing at ease with their hands in the air. [Anati 1960, p. 53, fig 7].

Four-wheels wagons: the image on plate 2 in Kemmo district shows a wagon (9.2Cm3) draught by bulls. Below there is one more pair of bulls in a team with an indistinct image of a vehicle. On the right part of the plate are numerous figures of people standing at ease, mountain goats, certain unintelligible animals and knives. Above there is a solar sign and images of two axes. [Anati, 1975; Piggott, 1983, fig 21; Muller-Karpe, 1974, taf. 441-13]. On a separate plate there is an image of a wagon, draught by a pair of animals and figures of certain sort. Below there is an image of a vehicle and two foot prints of a man. [Muller-Karpe, 1974, taf. 441-1]. Images of wagons are known in the other parts of the valley [Anati, 1976, p. 117, 123, fig. 108,123] and on amophorous rocks. All vehicles of this type have rectangular bodies and disk wheels. They are dated as phase IIIA, that corresponds to the end of the third millennium B.C. [Anati, 1975; 1976].

9.3. Sakhara. A few millenniums ago, this territory was a groovy savanne, similar in landscape to geographical conditions of the Eurasian stepe.

Tassili Adjer. There is a multiimage composition of rock engravings on same plateau in the Atlas mountains, which was discovered by the participants of a French

expedition under the leadership of H. Lothe. [1973; 1984]. There is a particular type of group among the images of vehicles of Tassili. Likewise only one type of chariot is represented. (fig. 38-39); 9.3Ts1-14;9.3Sh1-2).

If the draught animals are horses, then the vehicle is shown «in a profile» (However, there is an exception as to any other rule). The vehicle is usually shown with a couchman holding some objects like axes, whips and goad). As a rule, the horses are shown in motion, and the coachman in a tense mood. The message these images convey is «swiftness in mobility». Such images form part and parcel of compositions of people and animals. Each of the two images of chariots shown has a bull as the draught animal. The draught-pole of a vehicle is bent and is fixed to the scruff of an animal, and the vehicles are shown in such a way that, we can see a rectangular platform and two wheels with spokes. The animals are shown in a static posision. These images of vehicles are known in the other parts of Sakhara. [Mirimanov, 1973, p. 248; Trost, 1981].

10. Scandinavia.

The corpus of petroglyphs of this area, being rather diverse, is published in numerous issues. One of such issue would occupy several pages of this book. We can get some idea about them by generalizing the researches made on them. [Glob, 1969; Malmer, 1981; and other], (fig. 31-34).

There are lots of common features among rock art images is found in Sweden, Norway and Denmark. A total number of 61 images of vehicles exist in this region. They are concentrated mainly on the Swedish territory: 28 of them in province Bohuslan, 16 in province Skone, and 16 – in Ostfold (Norway). In south-east and western parts of Sweden and in province Estern Yetland. [Malmer, 1981, p. 43].

Gryt. The Province of Skone. On a massive horizontal plate there are five images of chariots, solar signs and some deepenings. The draught horses are shown schematically. [Historiska nyheter, 1976, p. 18].

Frannarp. The Province of Skone. On a horizontal plate there are 12 images of chariots fastened to one side of the draught-poles. The other plate depicts an image of four carts, three of which are with horses as draught animalsand are shown schematically [Anati, 1960, p. 59, fig. 12; Hayen, 1986, s. 109-138; Piggott, 1983, p. 117, fig 70-A].

Bottna. The Province of Bohuslan. Plate 364. The image of a two-axle vehicle on wheels with spokes draught by a pair of horses blocked by the image of a boat. The vehicle represents two conjoint chariots.

Plate 384 – An image of a four-wheel vehicle with a rectangular body and disk wheels (10.Bo4), in the midst of some people and certain images. [Fredsjo, 1975, p. 118-120].

Svenneby. The province of Bohuslan. Plate 232. A single image of a vehicle on fourwheels with spokes representing two chariots joined together. The second one has an A-frame draught-pole.

Plate 245. An image of a cart draught by a pair of the animals shown schematically. [Fredsjo, 1971, p. 18, 47].

Kville. The province of Bohuslan. Plate 308. An image of two carts draught by horses. There is a man with his hands in the air on the second vehicle.

Plate 334. An image of a chariot with a driver similar to that on the plates in Kivik. On a separate plate there is an engraving showing images of two chariots, one of which is shown without a draught-pole. [Fredsjo, 1975, p. 33-34].

From time to time we shall be making mention of some features of the Scandinavian images. Chariots are shown without drivers and without draught animals, or the later are shown schematically and among

images of wagons. Occasionally, it is possible to come accross joint type vehicles, where the later as a rule have an A-frame draught-pole. A perfect example is the one shown in the Rishd (Bohuslan), Langon (Norway) and the other monuments. (10.Of1; 10.Of3; 10.Of10; 10.Kv2; 10.Bh1), [Hayen, 1986, s.117]. We have already met similar types of vehicles in the Minusinsk Basin (Sedlovina, Shishka) and in Mongolia (Gobian Quadrig).

M. Malmer has come out with a criterium with the help of which the images of vehicles of Northern Europe are classified. The images are mainly divided into three groups depending on the presence or absence of draught animals and coachman. The first typeis refered to those vehicles with draught animals as well as a driver. The second type is vehicles with draught animals, but without a driver. And the last but not the least is the C-type vehicles with neither drivers nor draught animals.

Then, images are further classified- based on the amount of wheels shown on the given figure. 1- two-wheels; 2 – four- wheels; 3 – one wheel shown.

Finally, images are classified depending on the type of wheels; a – wheel with four spokes; b – wheel without spokes with a point in center (or shown as two concentric circles); c – plain round wheels; d – solid-wheels in a form of discs with some engravings on them. Combining these similarities and differences, we can differentiate and describe seven main types of vehicles. (fig. 38), [Malmer, 1981, p. 43-46, fig. 16, tab. 7].

* * *

There are ten large geographical regions on the Eurasia continent with rock engravings of vehicles and more than 70 found monuments.

	Name	num. of horse	num. of human	diametr of wheel	num. of spokes	gauge	wide of tyre	wide of spoke	long of hub	radius of hub	long of box	wide of box	height of box	long of pole	wide of pole	long of axe	wide of axe	long of york	publication	period
1	Xiaotun, M20	4	3											265	7,6x5	290	5.5-7.3	170	1970	Shang
2	Xiaotun, M40	2	3			225								255	10	290		210	1970	Shang
3	Xiaotun, M45	?	?																1970	Shang
4	Xiaotun, M202	2	2(3)																1970	Shang
5	Qiao Bay, M1	2	1	136	20	198-208		4,2	40	20-12	84-114	80	46	256		280	8	108+	2006	Shang
6	Qiao Bay, M18	2	2	120	?	214		7	46	14-20	100-136	64	48	?		292	7-8	?	2006	Shang
7	Guo Jia Zhuang, M1001	0	0																1962	Shang
8	Guo Jia Zhuang, M1003	0	0								100	70							1967	Shang
9	Xiaomintun, M1	2	1	122	?	240	8	8			134	83	40+	268	5-6X7-8	310	5-8	?	1977	Shang
10	Xiaomintun, M2	2	0	122	26	?	8	6			100	?	41	260?	6-7X5-9	?	5-8	?	1977	Shang
11	Xiaomintun, M7	2	1	133-144	22	217	10	7,5			129-133	74	45	256	9-15	306	13-15	110	1972	Shang
12	Xiaomintun, M698	2	1	140-156	18	240	5	4-5			?	?	?	?	?	298	10	?	1979	Shang
13	Xiaomintun, M1613	2	0	126-145	18	224	8	5			150	107	45	290	12-13	294	10	113	1984	Shang
14	Dasykuntsun, M175	2	1	146	18	227	6	6			94	75	?	280	11	300	4,1-7	120?	1955	Shang
15	Dasykuntsun, M292	2	1																1984, 1994в	Shang
16	Dasykuntsun, M755	2	1	130?			8	8								230	18		1994в	Shang
17	Dasykuntsun, M757	2	0	140?	20	?	8	8			?	100	44	292	12	274	12		1994в	Shang
18	Baydzyafyn, M43	2	0	134-147	18	223	6	4			137	73	22+	292	10	309	9,5-10		1994в	Shang
19	Baydzyafyn, M151	2	0	139	18	?	7,5	6			?	?	?	?	?	?	?		1994в	Shang
20	Mei Yuan Zhuang, M1	2	1	134-144; 144-150	22	220	8	6			164	113	55	274	10	302	10	135	1997в	Shang
21	Mei Yuan Zhuang, M40	0									105-132		30-41	80+	7,5-8	235?	5-7,5	98	1998в	Shang
22	Mei Yuan Zhuang, M40	2	1	137-149; 140-145	18	240	6	6			134-146	82-94	39-50	265	10-12	310	10,5	114	1998в	Shang
23	Mei Yuan Zhuang, M4	2	1	130-139; 130-142	18	217	7	6			128-144	70-75	43-44	280	11	305	10	153	1998в	Shang
24	Godzyadzhuan, M52	2	2	134-150; 136-143	18	230	8	6			142-146	94-103	38-46	268	12	308	10-12	235	1998	Shang
25	Godzyadzhuan, M146	2	0	120-139; 125-141	16	223	7	6			168-172	106-109	47-49	266	11,5	300-312	10-12	220	1998	Shang
26	Godzyadzhuan, M147	2	0	123-142; 132-142	20	226	7	6			151-149	90-94	48-49	272	11	308-312	10-12	140	1998	Shang
27	Liu Jia Zhuang, M339	2	0																1998	Shang
28	Liu Jia Zhuang, M348	2	1																1998	Shang
29	Liu Jia Zhuang, C																		1997a	Shang
30	Tsyanchzhanda, M40	2	1	120-140			5-8	6			130-160	80-100	35+		8-12	310	6-7		2005	Shang
31	Tsyanchzhanda, M41	2	2	145-150		230	5-6	5			140	97-105		266	6-9	310		185	2005	Shang
32	Tsyanchzhanda, M45	2	1	142-145		220	5-6	4			123-140	77-80		245	8-9	307		183	2005	Shang

	Name	num. of horse	num. of human	diametr of wheel	num. of spokes	gauge	wide of tyre	wide of spoke	long of hub	radius of hub	long of box	wide of box	height of box	long of pole	wide of pole	long of axe	wide of axe	long of york	publication	period
33	Tsyanchzhanda, M131	2	1	157-161	22	232	9	4-5	18	20	117-134	102	34+	274	7	309		133	2005	Shang
34	Tsyanchzhanda, M132	2	1	138-143	18	227	5	6	35	18	145	85	40	268	8	303	8	105+	2005	Shang
35	Laonyupo, M27	2	0	140	16	225					160	72	14+	240	7	315			1988	Shang
36	Tszyaosia county	4	0	125	20														1977	Western Zhou
37	Baysyaopo,G1	4	1	140	18	224	10	9			164	97	29?	284	8	304		134	1977	Western Zhou
38	Chzhanzyaopo, №35	2	0	ок.120							ок.95	ок. 90		ок.270		ок.300			1980	Western Zhou
39	Chzhanzyaopo, 167	2	1	129	22		4,4				107	86	25	281	6,5	292		240	1963	Western Zhou
40	Chzhanzyaopo, 168,№1	4	1	136	21	225	6,5				138	68	45	298		307		137	1963	Western Zhou
41	Chzhanzyaopo, 168,№2	2	0	135	21		5,6				135	70	20	295	7	294	7,8	210	1963	Western Zhou
42	Chzhanzyaopo, 185	2	1	140	22		6,5				125	80	44						1963	Western Zhou
43	Chzhanzyaopo, 192	8	1																1963	Western Zhou
44	Sianfyngao		0	138	22		9									288			2002	Western Zhou
45	Chzhenchzhouva Liu, №2	4	0																2001	Western Zhou
46	Luoyang, C3M230	4	0	120-135	20	220	4-4,5	5			150	50		184?	4-8	315	5		1999a	Western Zhou
47	Luoyang, №1	2	0	110			8,5				115	70	22?	170?	11	305?	9	122?	1988	Western Zhou
48	Luoyang, №2	2	0											240	8			220	1988	Western Zhou
49	Luoyang, №4	2	0	144	22-24	220	9				132	85	37?	291	6,5-11	317	8-8,5	202	1988	Western Zhou
50	Luoyang		0	130-140	18						120	96	6?	320	12	90?	8-10		1955	Western Zhou
51	Lyulihe, IM52CH1	4	0	140	24	244	7	7			150	90		260	14	308	8		1995	Western Zhou
52	Lyulihe, IM52CH2	2	0	120	24	ок. 210	5	5			150	110				305			1995	Western Zhou
53	Lyulihe, IIM202		0	140	24		6	5			160	80		ok.250	8	290	5-8		1995	Western Zhou
54	Tyanmatsyuchun, №1		0	140	20	223	7	6			135	51-38	274				4-2	108	2000	Western Zhou
55	Tyanmatsyuchun, №2		0		20						90	170							2000	Western Zhou
56	Zhuchzhachzhuan, №1		0	120	20	200	8	5-6			115	70	17-42	265	4,5-5-7	260	5-8	116	1988	Western Zhou
57	Zhuchzhachzhuan, №2		0	120	20	210	9	7-6			130	70		260	4,5-6-7	270	5,5-8	110	1988	Western Zhou
58	Zhuchzhachzhuan, №3		0	120	20	200	8	7			101	60	25	270	5-6-7	275	6-8	105	1988	Western Zhou
59	Huayuanchzhun, M3, №1	2	0																1986	Western Zhou
60	Huayuanchzhun, M3, №2	4	0								153	105							1986	Western Zhou
61	Huayuanchzhun, M3, № 3	2	0																1986	Western Zhou
62	Huayuanchzhun, M16, №1	2	0	132		220		8			123	97	ок 34	220	9	290			1986	Western Zhou
63	Huayuanchzhun, M16, №2	2	0	133		230		8			131	75	ок 34			291			1986	Western Zhou
64	Fensi, gr.1	2	0			164								ок. 160		280		158	1981	Western Zhou
65	Fensi, gr.2	2	0																1981	Western Zhou
66	Fensi, gr.3		0																1981	Western Zhou
67	Fensi, M28	4	0	136	22	217	7				108	100	30	ок 127	8-9				1987	Western Zhou
68	Fensi, M29	2	0	140	18	224	8				130	100			6				1987	Western Zhou
69	Fensi,M29	2	0	136	18	225	5				124		ок.23-30		7				1987	Western Zhou
70	Puduchun, M27	4	0																1988	Western Zhou
71	Shantsunlin, CHMK1: CH1		0	147-105; 138-102	22	172	8	5,5	20	16-9	120	98	19+	290+	9	225	8	88+	1999	Western Zhou
72	Shantsunlin, M2001, CHMK1: CH2		0	134-106; 146-106	26	180	7	5	28	16-11,5	120	96	20+	300	8	248	8	120	1999	Western Zhou
73	Shantsunlin, M2001, CHMK1: CH3		0	133-114; 140-80	24	174	6	5	27	16-10,5	106	88+	38	80+	7	240	8		1999	Western Zhou

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74	Shantsunlin, M2001, CHMK1: CH4		0	146-85; 122-86	24	180	6	5,5	26	16-6	116	92	30	120+	8	254	8		1999	Western Zhou
75	Shantsunlin, M2001, CHMK1: CH5		0	86-146-70?		190	6	5	26	14-10	92+	80+	20	140+	8	100+	8		1999	Western Zhou
76	Shantsunlin, M2001, CHMK1: CH6		0	152-66; 136-96?	28	176	6	5	26	18-8	120	80+	10-16	296+	8	230+	8	88+	1999	Western Zhou
77	Shantsunlin, M2001, CHMK1: CH7		0	122-70; 136-102?	28	184	6	5	18	18-10	130	88	22	290+	6-8	250	8	72+	1999	Western Zhou
78	Shantsunlin, M2001, CHMK1: CH8		0	140-110; 134-64?	28	180	6	5	26	14-10	37+	96	20	220+	6-8	254	8	56+	1999	Western Zhou
79	Shantsunlin, M2001, CHMK1: CH9		0								120	96		86	8				1999	Western Zhou
80	Shantsunlin, M2001, CHMK1: CH10		0	138-42?	12+		6	5				56+		46+	8				1999	Western Zhou
81	Shantsunlin, M2001, CHMK1: CH11		0	120-40?			6	5			84+	96		96+	8	60+	6		1999	Western Zhou
82	Shantsunlin, M2001, CHMK1: CH12		0	134-40?			6	5	26	14-7						164+	8		1999	Western Zhou
83	Shantsunlin, M2001, CHMK1: CH13		0	120-36?			6	5	30	15-7				150+	8	120+	8		1999	Western Zhou
84	Shantsunlin, M2012, CHMK2: CH1		0	140-86; 134-120?	24	170	7	5	26	14-8	36?	94	46	120?	6-8	250	8	120	1999	Western Zhou
85	Shantsunlin, M2012, CHMK2: CH2		0	87-140?	25	166	7	5	28	16-10	92	57?	28	192?	8	236	8		1999	Western Zhou
86	Shantsunlin, M2012, CHMK2: CH3		0	140-18; 90-108	22	180	7	5	26	15-10	100	92		134?	7	254	8		1999	Western Zhou
87	Shantsunlin, M2012, CHMK2: CH4		0	156-60; 140-110	23	176	7	5	22	14-10	105	86		300	7	232	8	130	1999	Western Zhou
88	Shantsunlin, M2012, CHMK2: CH5		0	94-40; 144-116	26	190	7	5	20	15-10	110	94	36	146?	6	234	8		1999	Western Zhou
89	Shantsunlin, M2012, CHMK2: CH6		0	140-118?	22	166	7	5	24	18-10	100	40?	38			232	8		1999	Western Zhou
90	Shantsunlin, M2012, CHMK2: CH7		0	114,148-114?	24	178	6	5	25	14-8	104	74?	34	294	7-8	240	8	100	1999	Western Zhou
91	Shantsunlin, M2012, CHMK2: CH8		0	140--56;136--120?	25	184	7	5	28	15-9			32	150?	7	256	8		1999	Western Zhou
92	Shantsunlin, M2012, CHMK2: CH9		0	126-40; 126-60	14?	196	8,5	6,5					16-10?	86?	7	140?	8		1999	Western Zhou
93	Shantsunlin, M2012, CHMK2: CH10		0	86-72; 130-62	15?	190	6,5	5	24	16-10						68?	7		1999	Western Zhou
94	Shantsunlin, M2012, CHMK2: CH11		0	106-70; 130-55?	24	194	7	5	26	13-9	108	82	20?	300	8	246	8	90	1999	Western Zhou
95	Shantsunlin, M2012, CHMK2: CH12		0	124-50;152-50?	14?	196	7	5	31	16-10	112	90	16-12?	290	7-8	256	8	104	1999	Western Zhou
96	Shantsunlin, M2012, CHMK2: CH13		0	62,142-45?	14?	180	7	5	28	14-9	106	84	21	105?	8	254	9		1999	Western Zhou
97	Shantsunlin, M2012, CHMK2: CH14		0	142-44; 140-50?	11?	180	7	5	26	16-10	108	96	15	258?	8	244	8		1999	Western Zhou
98	Shantsunlin, M2012, CHMK2: CH15		0	144-64; 136-118?	20	192	7	5	20	16-10	140	104	25	324	8	236?	8	88?	1999	Western Zhou
99	Shantsunlin, M2012, CHMK2: CH16		0	140-54?	5?		7	5			56?	98	20			80?			1999	Western Zhou
100	Shantsunlin, M2012, CHMK2: CH17		0	96-86?	11?		7	5	26	16-13				190?	8				1999	Western Zhou
101	Shantsunlin, M2012, CHMK2: CH18		0				7	5,5			68?	112	30	216?	8	96?	8		1999	Western Zhou
102	Shantsunlin, M2012, CHMK2: CH19		0	120-64?	9?		6	5	22	14-11	92?	88	22			90?	8		1999	Western Zhou
103	Shantsunlin, M1051, № 1		0	124-107	25	166	6	6		15	100	100		300	6-8	200	6	100	1959	Early Chunsu
104	Shantsunlin, M1051, № 2		0	97?	25	166	6	6		15	130	100			6	178+	6		1959	Early Chunsu
105	Shantsunlin, M1051, № 3		0	133-110	25	170	6	6		19	106				7	205	5		1959	Early Chunsu
106	Shantsunlin, M1051, № 4		0	130-114	25	174	6	6		16	107					222			1959	Early Chunsu
107	Shantsunlin, M1051, № 5		0	140-92	25	215	6	6		16					6	247	7		1959	Early Chunsu
108	Shantsunlin, M1051, № 6		0	135-95	30	175	6	6		14					7	217	6		1959	Early Chunsu

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109	Shantsunlin, M1727, № 1		0	133	25	155+	6	6	36		120	90	32	300	6-7,8	155+	6		1959	Early Chunsu
110	Shantsunlin, M1727, № 2			125	28	180	6	6	36	18-11	123	90	33	296	5,5-7,8	236	6,5	140	1959	Early Chunsu
111	Shantsunlin, M1727, № 3		0	126	25	184	6	6	35	18,7-13,1	130	86		250+	5,5-8,2	222	6,7		1959	Early Chunsu
112	Shantsunlin, M1727, № 4		0	122	26	169+	6	6	36	18,5-11,5	125	82	34	292+	5,5-7,8	227	6,3	140	1959	Early Chunsu
113	Shantsunlin, M1727, № 5		0	126	34	190	6	6	36	18-11,5	104+	90	30	300	6-9	226+	7	220	1959	Early Chunsu
114	Shantsunlin, M1811, № 1		0	119-117	26	164	6	6		14	130	82		282	6-8	200+	8		1959	Early Chunsu
115	Shantsunlin, M1811, № 2		0	126	44	175	6	5		17				300	6	236	7		1959	Early Chunsu
116	Shantsunlin, M1811, № 3		0	123-121	27	165	6	6,5		15	130	85				187+	7		1959	Early Chunsu
117	Shantsunlin, M1811, № 4		0	128-125	27	178	6	7		15						222	7		1959	Early Chunsu
118	Goutszyamao, №1	0	0							16	110	95		314	5-10	175+	6	72+	2005	Early Chunsu
119	Goutszyamao, №2	0	0				5	3			110	100		386	5-10	174+	6	72+	2005	Early Chunsu
120	Goutszyamao, M 1	2	0			204	7	2		13	110	90	10+	248+		248	6		2005	Early Chunsu
121	Goutszyamao, M 1, №1	0	0	134-128		139	5	4	43?	16	118	100		304	4,5-5			123	2005	Early Chunsu
122	Goutszyamao, M 1, №2	0	0	135-128		144	5	4	35-23	15	120	100	59	315	5-6	220+	7	110	2005	Early Chunsu
122	Goutszyamao, M 1, № 3	0	0	136-130		132	5	4	34-41	16-19	152	92	46+	314	5-8	147+	8	132+	2005	Early Chunsu, final
123	Fensyabatsitun, 83	4	1																1986	Early Chunsu, final
124	Fensyabatsitun, 98LDK1:1	4	1	132	28	208	5	5	52	8	78	170		292	8-12	286		123	2002	Early Chunsu
125	Fensyabatsitun, BS33:1	2	0	118	28	186	6	4			134	80				252	4	134	1980	Early Chunsu
126	Fensyabatsitun, BS33:2	2	0	134	28	213	6	4,5			134	78	33		10	286	5	134	1980	Early Chunsu
127	Fensyabatsitun, BS33:3	2	0	128	28	200	6	5							9	268	5-9		1980	Early Chunsu
128	Fensyabatsitun, BS26	2	0	140	28	213	6	5			149	96	27	335	7-10	280	4-8	140	1980	Early Chunsu
129	Shanmamudi, M 1, №1		0	145	35	183	6	5		11-12	112-118	100	44	360	6-8	275	6	120	1994a	Early Chunsu
130	Shanmamudi, M 1, №2		0	132	32	164	6,7	6		10-20	114	104	38	340	6-8	244	6-8	124	1994a	Early Chunsu
131	Shanmamudi, M 1, № 3		0	133	32	176	7,6	6		7,5-20	115-119	103	40	250+	8	270	5		1994a	Early Chunsu
132	Shanmamudi, M 3, № 1		0	134	29	176	8	7	64	8-20	110-117	83	30	320	7-8	252	4,5-8	104	1994a	Early Chunsu
133	Shanmamudi, M 3, № 2		0	138	29	188	8	6	54	8-20	82-120	95	30	314	6-8	258	4,5-8	112	1994a	Early Chunsu
134	Shanmamudi, M 3, №3		0	134	29	176	8	7	56	8-20	100-106	95	22	275	7-8	240	4-8	124	1994a	Early Chunsu
135	Lyuyshantszyu, M0026, № 1		0		26	187		4	44	18	116	145	12	343	13	234+		120	2003	Chunsu
136	Lyuyshantszyu, M0026, №2			132	28?	176	7,5	5	47	18	108	108	18	333	8X10	245	5-6,5	140	2003	Chunsu
137	Lyuyshantszyu, M0026, № 3		0	140	28?	190	8	5	60	20	140	96	18	200+	9x14	225+	5-6,5		2003	Chunsu
138	Lyuyshantszyu, M0027, № 1		0	140	26		7,5	6	62	20	35+	95	17				4,5-6		2003	Chunsu
139	Lyuyshantszyu, M0027, № 2		0	135	26		8	6	58	19	55+	90	22-58				4,5-6,5		2003	Chunsu
140	Lyuyshantszyu, M1009, № 1		0	136	26		9	4,8	44	18	100	100	8-48	330	6x10	240	4,5	140	2003	Chunsu
141	Lyuyshantszyu, M1009, № 2		0	130	26	192	6,5	3,5	60	17	126	90	10-43	316	6x12	280	4,5-7	150	2003	Chunsu
142	Lyuyshantszyu, M1009, № 3		0	137,5	26	192	8,5	4	58	18,5	140	103	18-59	333	6x12	268	5-7	120+	2003	Chunsu
143	Lyuyshantszyu, M1009, № 4		0	136	26		8,5		47,5	20	100	100	9	274	3,5x12	248	4,5x7		2003	Chunsu
144	Lyuyshantszyu, M1009, № 5		0	137	26	200	9	5	53	18	138	97	8-59	330+	7x12	270	5-7		2003	Chunsu
145	Lyuyshantszyu, M1058, № 1		0	130	26	176	7	4	44	17	110	96	9-49	315	5x11	244	4,2-7	139	2003	Chunsu, final
146	Lyuyshantszyu, M1058, № 2		0	135	26		8,5	4	60	18	128	96	15-53	180+	5x11	278	4,5-6	150	2003	Chunsu, final
147	Lyuyshantszyu, M1058, № 3		0	129	26	190	8	4	43	17	104	84	10-56	115+	4x11	242	4,2-7	118	2003	Chunsu, final
148	Lyuyshantszyu, M1061		0	140			7	5						260+	214+				2003	Chunsu

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149	Lyuyshantszyu, M1063		0															140	2003	Chunsu
150	Lyuyshantszyu, M1065		0	135			8,5	4,5	43	18	100	96	10-52	352	7x12	244	4,5-6	140	2003	Chunsu
151	Lyuyshantszyu, M1076		0	137		137	8	4,8	60	19	130	98	17-64	280+	7x10	290	5-7		2003	Chunsu
152	Lyuhedyan M2: 20		0								126	120		317				160	2000	Chzhango
153	Tangun, K 1	6?	0	130	30	180		7			120	110	30+			240		130	2007	Chzhango
154	Tangun, K 2, № 1	2	0	134	30	180		6						390	5-10	270	10		2007	Chzhango
155	Tangun, K 2, № 2	2	0	120	32			4			120	110		280	7-9	250	7		2007	Chzhango
156	Shinji Xinyu, gr.1	2	0																1994	Chunsu
157	Temple Sychuansyashi, M8CH, № 1	4	0	132	30	198					124	104	26+	234	6-14	224+	10		1991	Chunsu
158	Temple Sychuansyashi, M8CH, № 2	4	0	120				6			140	70+				116+			1991	Chunsu
159	Temple Sychuansyashi, M8CH, № 3	2	0	110+				6											1991	Chunsu
160	Temple Sychuansyashi, M36CH, № 1	4	0	130	28	212	4	4			126	94	44			250	9-11	106+	1991	Chunsu
161	Temple Sychuansyashi, M36CH, № 2	4	0	120	28	195	7	4		16-8	140	92	45+	292	8-12	222+		124+	1991	Chunsu
162	Temple Sychuansyashi, M2CH, №1	4	0								132	34+		110+	12-15				1991	Chunsu, final
163	Temple Sychuansyashi, M2CH, № 2	2	0								136	24+		150+	12-15				1991	Chunsu, final
164	Temple Sychuansyashi, M2CH, № 3	4	0								110	56+		130+	12-14				1991	Chunsu, final
165	Temple Sychuansyashi, M2CH, № 4	2	0	118	14+	182					123	76		15+					1991	Chunsu, final
166	Temple Sychuansyashi, M2CH, № 5	2	0								136	106		118+	12-14				1991	Chunsu, final
167	Temple Sychuansyashi, M2CH, № 6	2	0								190	126	32+						1991	Chunsu, final
168	Shanmamudi, M 2, № 1		0	140		206	8	7	52	8-22	100-106	100	42		6-8	260	6-8	146	1994a	Chunsu, final
169	Shanmamudi, M 2, № 2		0	137-140		208	8	6	60	7-22	100	93	22+		7-8	260	4-8		1994a	Chunsu, final
170	Shanmamudi, M 2, № 3		0	137		200	8	6	46	7,5-22	132	110	20	90+	7,5	277	4-7		1994a	Chunsu, final
171	Shanmamudi, M 2, № 4		0	140		208	8	6	47	9-22	126	90		130+	7,5	240	4-7		1994a	Chunsu, final
172	Shanmamudi, M 2, № 5		0	140		200	10	7	42	8-22	106	98				250	4-7		1994a	Chunsu, final
173	Tszyangou, M251, №1		0	115	30	190	4,5	4,5	40	10-20	136	120	48?		9	256	9		1996	Chunsu, final
174	Tszyangou, M251, №2		0	105	30	200	7	4,5	45	19-9	127	124	45?		9	260	9		1996	Chunsu, final
175	Tszyangou, M251, №3		0	134	26	200	7	5	47	20-10	142	117	62?		10,5	275	8,5		1996	Chunsu, final
176	Tszyangou, M251, №4		0	108	30	196	8,2	5	39	19-9	118	125	53?		9	250	8		1996	Chunsu, final
177	Tszyangou, M251, №5		0	128	28	193	5	5	40	19-8	120	100	51?		8	263	8		1996	Chunsu, final
178	Tszyangou, M251, №6		0	130	26	182	5	4,5	44	20-2	114	114	50?		8+	252	9		1996	Chunsu, final
179	Tszyangou, M251, №7		0	116	26	192	5	4,5	44	18-9	115	120	55?		8	252	8		1996	Chunsu, final
180	Tszyangou, M251, №8		0	130	26	186	6	4,5	47	18-9	136	114	65?		10	257	10		1996	Chunsu, final
181	Tszyangou, M251, №9		0	134	32	188	7	4	50	19-6	120	97+	55?		9	258	10		1996	Chunsu, final
182	Tszyangou, M251, №10		0	123	28	195	8	4	50	19-8	120?	100+	50+?		8	268	8		1996	Chunsu, final
183	Tszyangou, M251, №11		0	125?	289?	190	7,5	4			154	30+			8	250+	8?		1996	Chunsu, final
184	Tszyangou, M251, №12		0	134?	26+	190	7	4	58	20-6	146	106+	15+?		8	285	8		1996	Chunsu, final
185	Tszyangou, M251, №13		0	125-135	26+		7	4											1996	Chunsu, final
186	Tszyangou, M251, №14		0														8		1996	ЧChunsu, final
187	Tszyangou, M251, №15		0														9		1996	Chunsu, final
188	Chanvu Menchu	2	0	122	24	190	7		51		147	94		305	6-10			160	1984	Between Chunsu and Chzhango
189	Fengxiang Ma Jia Zhuang	0	0	64	25	160	4	3			120	80	20?	155?	5-10	200	6-10		1985	Early Chzhango
190	Houchuan, M 2129	2	0	130?	20?	180	8	5			108	109		300+	10	230?	10?		1994a	Early Chzhango

	Name	num. of horse	num. of human	diametr of wheel	num. of spokes	gauge	wide of tyre	wide of spoke	long of hub	radius of hub	long of box	wide of box	height of box	long of pole	wide of pole	long of axe	wide of axe	long of york	publication	period
191	Houchuan, M 2152	2	0			190?	5	6											1994a	pEarly Chzhango
192	Fengxiang Yichun, S1	2	1	116	28	195	7	6	48		133	93	42?	179+	11-8	257	6-7		1986	Early Chzhango
193	Fengxiang Yichun, S2:2	?	0																1986	Early Chzhango
194	Huysyan Lyulige, M 131, №1		0	140	26	190	8	5,5	38	22	130	104	36	170+	8	242?			1956	Early Chzhango
195	Huysyan Lyulige, M 131, №5		0	95	26	140	6,5	4,8	16+	16	95	93	27+	120+	4	178			1956	Early Chzhango
196	Huysyan Lyulige, M 131, №6		0	105	26	185	7,5	6,5?		18	120	98	42	205	8	242			1956	Early Chzhango
197	Huysyan Lyulige, M 131, №16		0	130	26 (30)	182	7?	8	24?	17	140	105	40	210	10	236+			1956	Early Chzhango
198	Huysyan Lyulige, M 131, № 17		0	140	26 (30)	180	7?	8	24?	20	150?	110?	40?	215	10	242			1956	Early Chzhango
199	Lyuhedyan, M2, №1		0								172	122				292	7-4,8		2000	Early Chzhango
200	Lyuhedyan, M2, №11		0								140	210	40						2000	Early Chzhango
201	Lyuhedyan, M2, № 20		0								126	120		317				160	2000	Early Chzhango
202	Henan Xin Zhong Xin Yu, №1	2	0																1994	Early Chzhango
203	Henan Xin Zhong Xin Yu, №2	2	0	74															1994	Early Chzhango
204	Chzhunchzhoulu, M19	4	0	169	18?	200?	9		40	16-8	160	150	35-40			277	10	141	1974	Middle Chzhango
205	Zhong Shan Wang, M 2, №1		0	76?	22?		7	###			168	156	53?	224		260	9	141	1996a	Middle Chzhango
206	Zhong Shan Wang, M 2, №2		0	80?			6,5-7				170	180	49-42	176	4,5-8-12	268	11	160?	1996a	Middle Chzhango
207	Zhong Shan Wang, M 2, №3		0	80?			7				130	130		160?	4,5-7	206	9	160?	1996a	Middle Chzhango
208	Zhong Shan Wang, M 2, №4		0	78?	22?		6,5	3,5			140	132	47?	160?	4,5-10	215	10	160	1996a	Middle Chzhango
209	Tszyanlintszudyan, M 104, № 2	2	0	126	26	184	6	4,5	45	19-12	152	100	36	340	9-12	271	12	136	1995	Middle Chzhango
210	Lougan, M1CH, № 1	2	0																1993	Middle Chzhango
211	Lougan, M1CH, № 2	2	0															95	1993	Middle Chzhango
212	Lougan, M1CH, № 3	2	0	131	26	198	4,5	6	40	12-15								80+	1993	Middle Chzhango
213	Lougan, M1CH, № 4	4	0	134	26	188	4,5	5	44	7,5-14	145	114	65	351		260	5	117	1993	Middle Chzhango
214	Lougan, M1CH, № 5	3	0	131	26	194	4,5	6			150	130					6,8		1993	Middle Chzhango
215	Lougan, M1CH, № 6	3	0	102	26	185	4	5			145	109		307		228	6		1993	Middle Chzhango
216	Lougan, M1CH, № 7	2	0	140	26	197	4,5	5			135	115		313+		268	6		1993	Middle Chzhango
217	Pinlyanmyaochzhuan, M6	4	0	127	30	195	6	3,5 -4			140	95	30-40	290	3-6-7	274	6,5-8	145	1982	Late Chzhango
218	Pinlyanmyaochzhuan, M7	4	0	114	30	200	5-6	2?			126	99	30-40	267	9-11			136	1982	Late Chzhango
219	Matszyayuan, M1, №1		0	120															2008	Late Chzhango
220	Matszyayuan, M3, №1		0	140	38											300			2008	Late Chzhango
221	Matszyayuan, M3, №2		0	140	32											288			2008	Late Chzhango
222	Matszyayuan, M3, №3			158	38					13-19			82						2008	Late Chzhango
223	Matszyayuan, M3, №4			158	28														2008	Late Chzhango
224	Huaian Manchzhun №4	4	0	136	32	208	9,5	5,5	65	17,2-8,8	148	110	34,5	340		294	11		1984	Late Chzhango
225	Huaian Manchzhun №7	4	0	146		195			59	18-5,5	160	98		310		274		125	1984	Late Chzhango
226	Huaian Manchzhun №13		0	136	32		10				273			490		257		136	1984	Late Chzhango
227	Shindihuan, №1	4	0	66,4	30	95	4	2-2,4			74	48,5	21,5-45	183		134	1,56-4	80	1998	Qin
228	Shindihuan, №2	4	0	59	30	99,8	4,4	2-2,4			36,2-78	35-88	14,3-56,3	246		143	1,9-2,4	79	1998	Qin

Application 3.

What should be added to read: an overview of new discoveries and publications

The literature on linguistics and Indo-European origin

The number of major publications on the subject already has hundreds of serious research, analysis of which requires writing a book. Of the many surveys before 2000 note books of P. Raulving [Raulwing, 2000] and George Mallory [Mallory, 1989], in which a detailed analysis of existing theories in this regard.

Among the recent studies which support the origin of the Indo-European in the steppes, which are collected and accounted for many of today's views and contributions on this issue, I note the book by David Anthony [Anthony, 2007]. Detailed review of the book recently published by L. Klein [Horses, chariots ....., 2010, p. 167-181].

The latest data on the early stages of domestication of the horse in the steppeland are in the works of E.E. Kuzmina, P.A. Kosintsev and S. Kullanda [Horses, chariots, ..., 2010, p. 5-87].

The Era of vans and battle wagons (3-d mill. BC)

Northern (Pit's-Afanasievo) transcontinental channel. More and more data appears to substantiate Afanasievo strata in the ancient art of Southern Siberia, Altai, Mongolia and Northern China.

Compiled and published a complete catalog of currently known Okunevo's steles [Leontiev, Kapelko, Esin, 2006], which allows more arguments to consider the questions of origin and chronostratigraphy.

New materials from southern Siberia, Tuva and Khakasia gives additional arguments in favor of early selection in the formation of Okunevo art (petroglyphs and steles) and associate it with the emergence of western ranching population migration [Lazaretov, 1997]. The author distinguishes the early masks of "dzhoysky type" and sees these images as markers on the periphery of the ancient ways in Minusinsk basin, marking the most convenient path from Khakassia to Tuva [Lazaretov, 2011, p. 59-64].

Yu. N. Esin arguments highlights of Afanasievo layer in petroglyphs of Minusinsk basin [Esin, 2010, p. 53-73, 2011a, p. 81-98], and by conducting an audit preserved petroglyphs, concludes that the absence of some images on the rocks – in particular, the two vehicles from Tunchukh [Esin, 2011, p. 31, oral presentation].

Northern Mesopotamia. Isolated communication system of 3—2 mill. BC in Mesopotamia, associated with the supply of copper ore and development of gold, silver and zinc [Amirov, Nemirovsky, 2002, p. 273-286]. Four major roads in the latitudinal direction linked Anatolia, northern Mesopotamia and went to the north-west – in the Assyrian steppe and further to the west. An extensive network of roads through the south-north main roads are linked to each other. The ancient road up repeating many of today's route, as are the most convenient and adapted landscapes.

Southern (Turan) communicative channel. Through the efforts of various international expeditions, new information on the Bactria-Margiana Archaeological Complex (BMAC).

Stand out unique in its scale and significance of the new results of Margiana's archaeological expedition under the leadership of Victor I. Sarianidi, especially large-scale excavations of Margush's capital – Gonur Tepe.

V.I. Sarianidi explains the migration of this civilization from Sumer and North Mesopotamia (possibly – Anatolia) of the population, and then deposited on the banks of the Murghab river, and interact with the Harappa [Sarianidi, 2008, 2010].

H.-P. Frankfort binds to materials BMAC known on the cuneiform writing sources with the country Marahshi (Barahshi or Margush in the interpretation of V.I.Sarianidi), indicating that some degree of reliability have been identified Elam, Awan, Anshan, and Simashki in the south and south-western Iran. From the Persian Gulf to the Indus valley and Harappa civilization – is Dilmun, Magan and Meluhha.

Perhaps Tukrish located in the north-west of Iran and Aratta – in the province of Kerman. In the Old Babylonian period, the country Marahshi moved to the area closer to Mesopotamia – perhaps in the Zagros. But at the end of the 3-d – beginning of 2-nd mill. B.C. Marahshi was definitely a country that is independent from Elam and Mesopotamia, which controlled the eastern part of the Iranian plateau, and acted as an intermediary between the Mesopotamia and Elam in the west and in the east – with Meluhha [Frankfort, 2006, p. 193-194].

In any case, new discoveries in the southern part of Central Asia, the focus of a powerful ancient oriental civilization, are in good agreement with the second and especially third "conjunctions" as described in this book.

For materials of Gonur Tepe has a series of 59 calibrated radiocarbon dates determining the lifetime of the capital of Margiana in the range 2500-1500 cent. B.C. The most intensive use was at the turn of 2000 BC. By 1500 B.C. life on the monument was stopped. [Zaitseva, Dubova et al, 2008, p. 166-179].

Anthropological materials from Gonur Tepe characterized polymorphism, pronounced Southwest anthropological component – of course, associated with that part, where in the 4 th mill. BC the Sumerians lived. Their appearance is well known for his anthropomorphic plastic. There is a certain resemblance to the skulls from the Swat river valley and Mohenjo-Daro. There was no presence of physical types, similar to paleoeuropeans population of the Eurasian steppes. At the same time, witnessed by the presence of an anthropological component, similar to the Mediterranean, including Srubnaya (or even earlier) groups of the Volga, Urals and Southern Alacul that seems to be evidence of movement from the south to more northern areas than from the steppes – in south. This similarity probably indicates the involvement of identical layers in the formation of anthropology as a South Turkmens and steppe tribes as well [Dubova, 2006, p. 169-173].

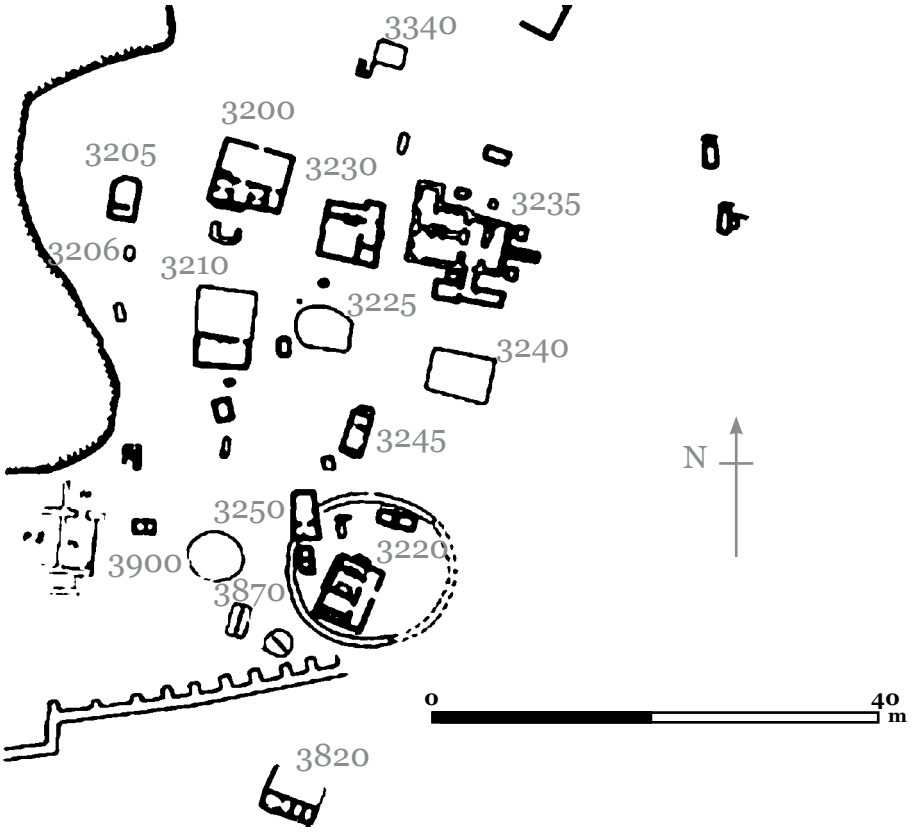


Fig. 1. The scheme of «Royal necropolis» of Gonur. Burials with wagons – 3200, 3225, 3240, 3900 [Sarianidi, Dubova, 2010, p. 144-171].

Burial. Most of them were robbed in antiquity. Of the 2853 objects detected in the cemetery, only in 174 cases it was impossible to determine whether they visited the ancient robbers. Type of facilities associated with the social structure of Gonour's society, which in its heyday was very positive: 85% – middle class, 11% – of the poor and 4% – the elite, which is characterized by burial in chamber tombs, or cysts.

Chamber tombs are a simplified version of Margiana's aristocracy houses. It is in these tombs, "the royal necropolis" and adjacent circular holes found four unique Gonour's wagons (Fig. 1). One of them is found directly in the "yard" of tomb (3200), and the rest – in the grave pits 3225, 3240, they clearly tend to be "dead houses" 3230 and 3235 – respectively. Fourth unearthed later – in the circular burial pit 3900 – and is adjacent to the tomb of 3220.

In the 3225 grave pit wagon found in disassembled condition: the west wall of the pit are two pairs of wheels (Fig. 2), all four wheels were exactly the same design as in the tomb 3200, but larger in diameter (90 cm). Next to the wagon, partly on the wheels themselves, lay a wooden seat, the design is different from what was in the tomb 3200. This seat – long (160 cm), narrow (32 cm) with low back (length 165, height 15 cm) and with arms the same height on both short sides. The seat is made from one board width 32 cm and 2 cm thick, and back and arms – three narrow strips of the same thickness and width of 5 cm, and attached at a distance from one another.

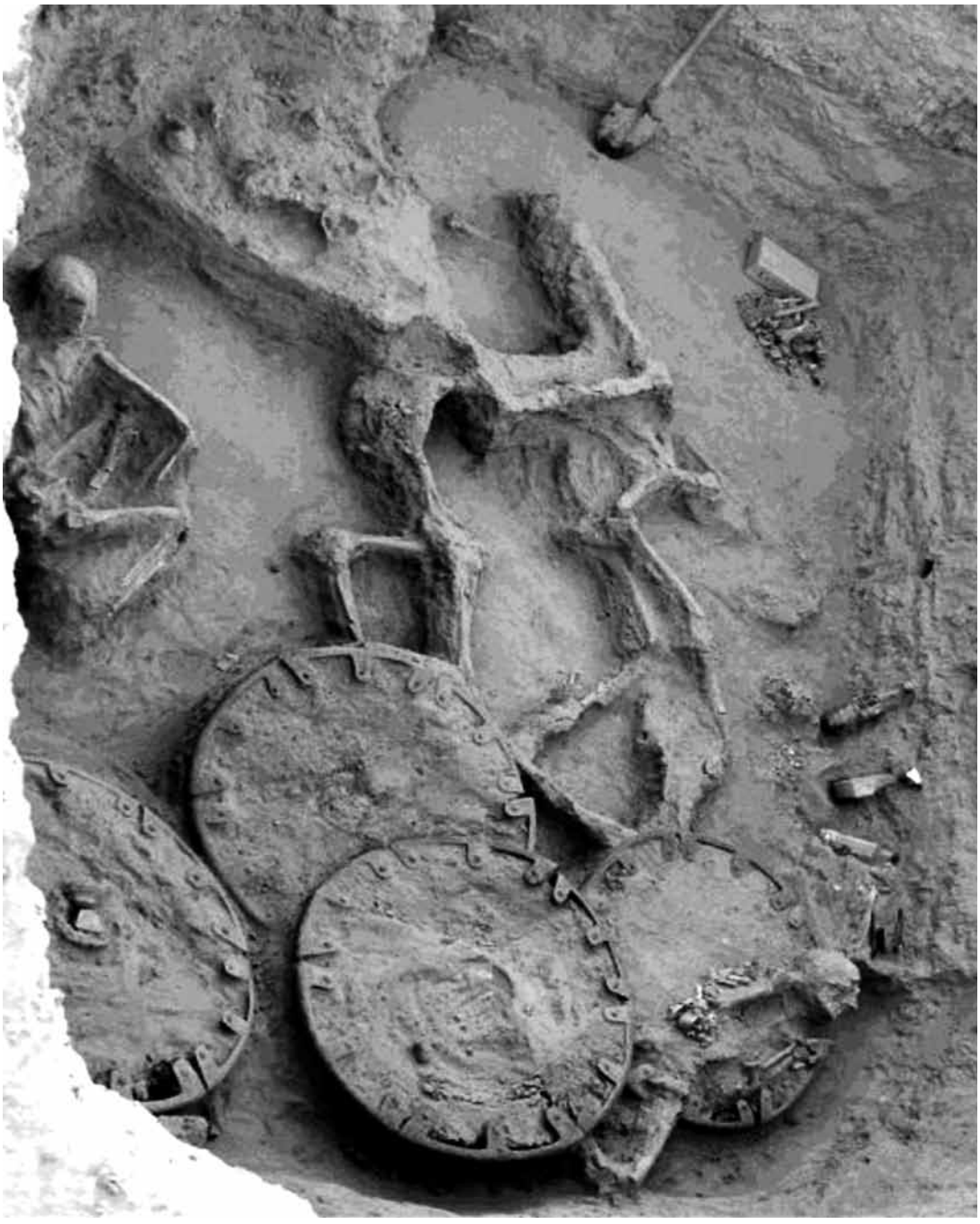
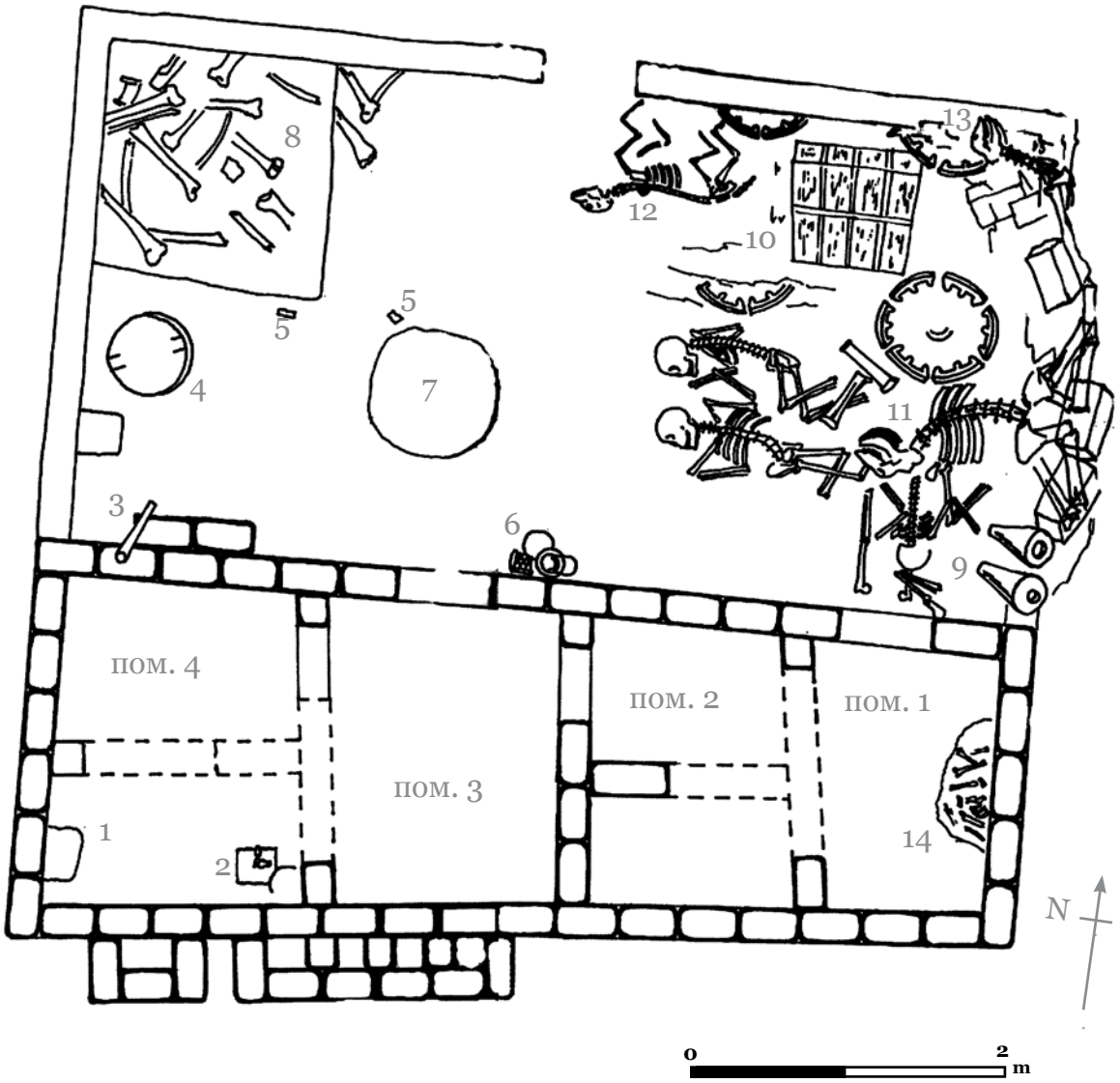


Fig. 2. General veiw of tomb 3225 [Dubova, 2004].



The scheme of the tomb 3200. 1 – cluster of valuable funerary gifts; 2 – two pieces of mosaic with «carpet» ornaments, silver cosmetic bottle, cosmetic spatula, a pin in the form of lying calf, steel pin in the form of star, crescent, and the standing argali from gold and turquoise reclining lion; 3 – stone baton of 2.0 m long, with the end of the form of a horse's hoof; 4 – stone disc from marbled limestone; 5 – bronze objects of uncertain purpose; 6 – two bronze «torches» and the ceramic vase on the stem with ornaments; 7 – red spot of heated sand; 8 – cluster of bones from adult camel; 9 – two large ceramic vessel with a narrow-bottomed; 10 – four-wheel carriage; 11 – the skeleton of an adult camel, which lies in its anatomical order; 12 – the skeleton of a dog in full anatomical order; 13 – strongly destroyed skeleton of young horse; 14 – disorderly accumulation of bone remains of four people [Sarianidi, Dubova, 2010, p.144-171].

Tomb 3200. In the north-eastern corner of it's "court" found the wagon, all four wheels which have been preserved, as well as the wooden "seat" (or the bottom of the body?). One pair of wheels placed close to the northern wall of the "yard". They survived better then another, once free-standing couple.

The seat is made of boards (0.2 x 0.9 m with a thickness of 0.20-0.25 cm) laid flat parallel to the wheels. From the four boards (their total width – 0.8 m) traces of wood about 0.1 cm thick for fixing planks "seats" are used between the wooden slats are narrow 5 cm wide, attached perpendicularly to the boards at a distance of 40 cm on one to another. They found two. The first is at a distance of 25 cm from the presumed front of the seat. Rather, they were embedded in an array of key boards, as edge of the planks do not extend above the plane of the "seat". The distance between the axles front and rear pairs of wheels – 1.1 m

The seat carriage is not in the middle between the wheels and shifted closer to the rear axle. Moreover, we can confidently assert that it is not connected with the destruction of the "seat" because, for a sufficiently good state of preservation boards, around the front axle was not met by the slightest piece of wood. The seat starts just behind the front wheels supposed, and ends at 20 cm from the rear end. It is located at a distance of 25 cm from the plane of the northern wheels. With the destruction of the wagons and the wheels fall of the southern – most likely a result of rotting wood, the southern part of the seat down to a height of 35 cm above the floor, "the court". Northern territory as it was at the height of 60 cm based on the foregoing, one can imagine that the "seat" towered over the axles and it was much narrower than the width of the entire wagon.

Since no trace of wood or bronze, other than those described, near the wagon were not found, the length of the axis of the vehicle can be reconstructed based on the width of the "seat" (80 cm), the distance "seat" of the plane facing the wheels (25 cm) and the estimated thickness of the wheel and sleeves, as varied from 150 to 160 cm.

All four wheels have the same diameter (0.7 m) and made as solid wood. Wood disks were obtained by combining the three wooden timbers in the center of the thickness of at least 10 cm and tapering to 5 cm to the edges. Two extreme chopping block are in the form of sectors, and the central – rectangular with two slightly rounded edges. Chopping block are connected flush. In addition, reveal two thin (5 cm) rack mounting, placed across all three timbers. Their small thickness shown by the fact that their clay skeletons rise above the surface of the wheel preserved to a height of about 5 cm. It can also talk about what they were embedded in an array of timbers, in order to achieve greater rigidity.

On the wheels of the tomb 3200 in the center has been found not the slightest piece of bronze or other metal that could talk about the method of fastening the axis. This supports the fact that the hub was made from wood. The same is shown and the wheels of the tomb 3225. In the first, second and third wheels partially preserved skeletons of the hub of clay. They – the round, with the skeleton of a clay wheel hub first kept the course of the fibers along the circumference of the tree, which allows to confidently say that it has been machined (cut down?) from a piece of the wood. On one side of the sleeve has a small ledge (width of 4.5 and 3 cm long), securing it in an array of longitudinal fibers of the middle block. On the other side

of this ledge hub is not detected, but one can assume that its simply did not survive, because fixing the board in a wooden cylinder with only one spike was hardly strong enough.

Bush has a ledge. Outside its diameter – 22 cm, inner – 17 cm, diameter hole of axis – 7 cm. Since the sleeve is best preserved on the first wheel, can not be absolutely certain that it was bilateral.

An indirect confirmation of the presence of two-way hub on the wheels are two clay models of wheels found in the premises of the temples in the Northern Gonur (Fig. 3).

Outside the wheel, found in the tombs 3200 and 3225, were covered with bronze rims (tires), consisting of six bronze arcs with brass eyelets for attaching rivets to a wooden base.

Traces of the same tires are available and on fragments of wood from a tomb 3240. Characteristically, the width of the tire of wheel is not dependent on their diameters: in the tombs 3200, and in 3225 it amounted to 3 cm.

The total height of the rim with an eye to the tomb 3200 is 5 cm, and in 3225 – 11 cm, and in 3240 – one fragment – 10, and on the other – 10.8 cm, length: 3.5 cm, 9 cm, 8.7 and 9 cm, respectively. The width of abalone: 3, 5 and 6 cm. Each of the six fragments of the rim had three abalone. In their places survived and most of the bronze rivets. The length of the rivets with caps in 3200 – 8 cm, and in 3225 – 7.5 cm, thickness of the rod on all wheels – about 1 cm, the largest cap diameter – 1.8 cm

In the 3200 tomb is best preserved northern front and rear wheels. At the burial, they were leaning against the wall to the north as "yard", so even if the destruction of the axes and the other, apparently, wood and leather fasteners wagons, they were standing almost in its original position.

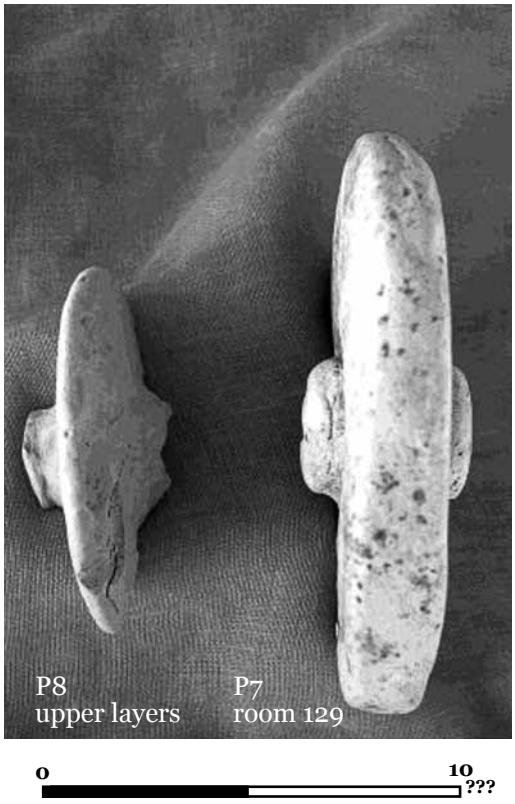


Fig. 3. Models of wheels from sector 8, the upper layers (left) and from sector 7, house 129 (right) [Sarianidi, Dubova, 2010, p. 144-171].

South rear wheel fell flat, and so, too, is well preserved. It was on the plane of its wooden wheels reached us in the fullest form. The fourth wheel is falling as a result of destruction of the fixture (or damage to the robbers?), broke into several pieces. And if the other three wheels bronze rims on a thick, apparently close to the original (about 0.5 cm, which is confirmed by the much better preserved of the wheel from tomb 3225), that on this – it is extremely thin, is represented by small fragments. Even the site of attachment with rivets visible only with difficulty.

Similar type of wheel (if not identical) existed in Bactria, as indicated by similar bronze rims encountered in the plundered tombs, as well as during the excavations at Susa's Apadana» [Pottier, 1984, p. 226: Pl. XLIV, No 326; Mecquenem, 1943, p. 98-99, quoted by: Dubova, 2004, p. 277-279].

Fig. 4. Two bronze segments from wheel's «tire» from tomb 3200. [Dubova, 2004].

Tomb 3900. Is a circular pit in terms of (5,8 × 4,9 m) in the immediate vicinity of the tomb 3220 [Sarianidi, 2008, 2010; Dubova, 2004] to the west of it (Fig. 1).

The central place on the floor of the pit (depth to 2.5 m) is four-wheel wagon. Only one of the wheel (No 1 or the south-west, its axis is located at 160 cm from the southern wall of the pit) is vertical. The other wheels are located in different parts of the pit. Wheel No 2 (southeast) is located at 104 cm from the No 1. Wheel base between No 2 and No 3 (northeast) – 135 cm. Wheel (No 4) lies flat on the bottom of the pit, in the north-west corner.

All four wheels are identical diameter – 100 cm, all the wheels is the same as we have previously described in the tombs 3225 and 3240 [Dubova, 2004. a. 277-279], three massive wooden chopping block, having a center thickness of not less than 10 cm and tapering to 5 cm to the edges. Two extreme chopping block are in the form a semicircle, and the central – rectangular with two slightly rounded edges. Scaffold made from hardwood trees (as defined by M. Tengberg – willow: Tengberg, 2008) and are connected by flush. In the tomb 3900 none of the wheels is not seen the traces of two thin strips of fixing placed across all three timbers above and below the hub. It can not unequivocally indicate the absence thereof, as from the tree only traces remained, and probably not to the entire thickness (the thickness of the wheel is restored to comparative measurements of all the wheels).

All the wheels have well-preserved bronze rings, whose width is 5 cm (exactly the same as the wheels in the tombs 3200, 3225, 3240), and length 52 cm, rim of each wheel is composed of six pieces, each with three "ears" (length 10,5 -11 cm), mounted on wheels array of thick bronze rivets (cap diameter 20 mm) thickness of the "nail" is 10-11 mm.

Wheels 2 and 3 are split in such a way that their arrays collapsed into several large fragments. Every element of the rim lies separately on its "own" a piece of wood. Some fragments of these wheels are below the sandy floor to 10-15 cm.

Standing upright wheel No 1 clearly shows that the hub was bilateral. It's – wood and has an outer diameter of 20 cm and the thickness of the protruding part of the 3.5 cm inner diameter is 18 cm diameter

Fig. 5. Wheel number 1 from the wagon in tomb 3900 in the process of clearing (view from the East). [Sarianidi, Dubova, 2010, p. 144-171].

Fig. 6. Tomb 3900. View on a wagon from the North. Front part (a) and back part (b) of the seat. [Sarianidi, Dubova, 2010, p. 144-171].

inner hole – 7 cm, which also coincides with the data of the wheel from tomb 3225. Bush above the preserved traces of the plane of the wheel at 5 cm from both sides. Just as in the tomb 3225, hub retained the skeleton of the course of the fibers along the circumference of the tree from which it was made, as well as small protrusions (traces – very bad) with its two sides (width 4 and length 3 cm) for mounting inside the central scaffold wheels.

Between the front (No 3, 4) and rear (No 1, 2) wheels are traces of the seats. Traced five planks laid along the wagons (on the front axle to the rear). Each of the three boards, stacked in the middle, have a width of 20.5 cm, and the extreme – to 11 cm. The total width of the reconstructed 83,5-84 cm in preserved length of the traces of boards – 40 cm between the front and rear "axle" (more accurately – a place of their possible locations) – 115 cm in contrast to the seat of the wagon from tomb 3200, in the grave we can say that the seat was located throughout the wagons (from front to rear axle), because the wheels 1 and 2 are also tracked the traces of the same boards as the wheels 3 and 4. But this part of the safety seat is much worse, can be traced up to 15 cm in length. At a distance of 20 cm from the northern edge of the seats (front) can be traced poorly preserved traces of the transverse slats, incised in a longitudinal array of boards (width 3 cm) and stiffening the whole structure.

The front of the seat is 52 sm above the back as the result of the destruction of vehicles.

In the central part of the pit, which has completely destroyed the seat, and at different levels of coverage, and on the floor of the pit met the fragments of the adobe bricks.

Directly from the front of the seat begins next round wooden pole (diameter 3 cm, length 132 cm), which ends near the northwestern wall of the pit near the skull of ass. Fragments of the second pole traced to a similar length of 100 cm and placed on the wheels No 3 to the human skeleton 7, covering the skeleton of a camel 2. Judging by the size and location of the poles, it is likely that these were the shafts of the wagon.

In general, the observed vehicle may be reconstructed as it is presented in Fig. 7.

There is no data to restore the frame, which was attached seat is not clear yet, and the manner of attaching shafts. As there were no bronze objects (and their signs), which could serve as a snap-in design, in the burial was found, we can assume that the leather straps were used".

<.....> "The sequence of burials and burial pit fill can be restored as follows. Position wheels, seat tracks and the wreckage indicates that the wagon was able to reset the whole top floor of the pit, and the first among all other objects and bodies. Given its size and overall a lot of weight when the wheels hit the ground cracked and fell apart, and No 4 wheel came off from it's (front?) axis, and rebounded after falling flat in the north-west corner has an empty pit. Then on top wagons were lowered into the pit camels (one from the west, and the second – on the north wall), then asses (and the first and second, most likely, from the north-west corner of the north or the wall). Apparently, this time from the southern, eastern and southeastern sides of the pit were laid stone staffs, as well as ceramic vessels (first and second), and also lowered the bodies of two people: one on the south wall (No 3, 35-45 years) and the second – from the north (No 2, 20-25 years). These were obviously dead was lowered, not dropped from the top or stacked someone were inside the pit. They both let down feet first. Body of the "southern" man even tried to give the standard position: on the right side, legs bent at the knees. "North" is clearly the

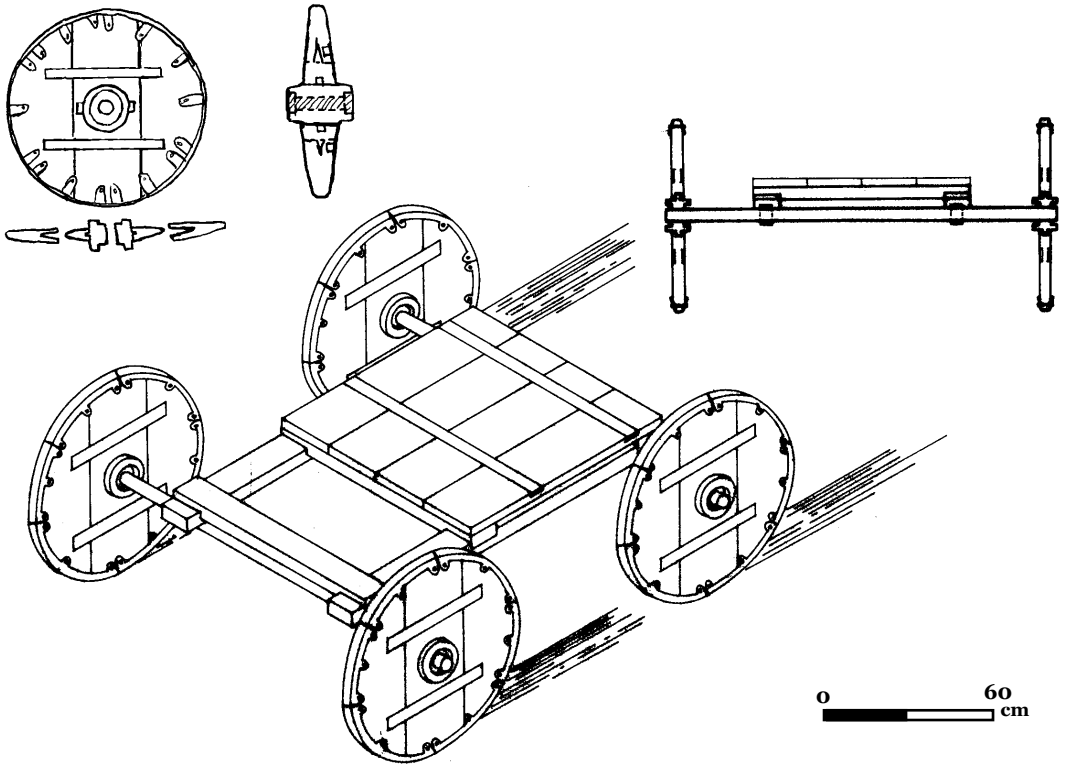
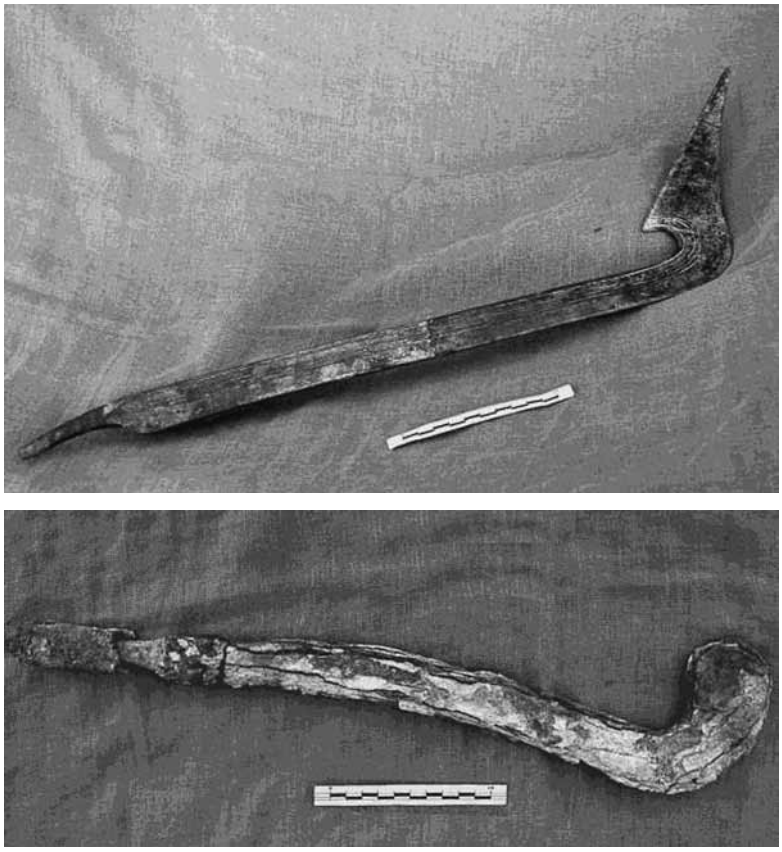


Fig. 7. Reconstruction of the wheels and wagon from tomb 3200. [Sarianidi, Dubova, 2010, p. 144-171].

backbone of the wall fell forward, though, most likely, it also tried to put on the wall like "south." Perhaps, soon, or at the same time the body of another man (No 5, 25-45) put next to the gray stick so that his knees were on a ceramic vessel with a fingertip patterns. As above, this skeleton is covered by a large bronze cauldron, to judge how the human remains were placed in a pit, while (to remove the bronze after conservation) is impossible.

It should be emphasized that the cauldron was also thrown into the pit. And with considerable effort. This is confirmed by the existing strain on the cauldron, which in no way could not have occurred as a result of pressure filled soil pit, and even more eloquently – that thick black rod (diameter at the ends 5 and 7 cm) split into three parts . On the one hand, empty, even such a large amount of copper would hardly broke a thick stone staff. The bottom of the caulderon, in which it's fell, did not have a significant dent, which is inevitable in the fall empty metal containers. But on the other hand, in the same grave No 3880 staff of gray stone was fairly accurately sawn into two parts, ie deliberately damaged before placing it in the grave. Since the position of fragments of the staff, leaving one end deep into the sandy floor of the pit, said that the stone lying on top of the boiler has fallen from a height – most likely that the staff was not destroyed by falling on his boiler, but was fragmented in advance. It is important that the boiler, as well as a wagon and a dog, has a dominant position on the floor of the pit. Apparently, it was dropped on the



Gonur Tepe. The Royal necropolis. Tomb 3130. «Harpoons». [Dubova, 2004, p. 260].

floor next to one of the last wagon, that is, after putting it all dead slaves (servants?), donkeys, camels and possibly with the dogs.

Apparently, along with two ceramic vessels in the pit were placed on the cone-shaped bronze lamp base and a bronze vessel, consisting of seven spherical tanks. Stand the container of the seven "balls" deformed quite uncertain. Therefore unlikely to have special reason to say that Margushians who performed burial, planned to put it in a burial pit vertically. Rather, his position did not have a fundamental significance. The main thing was that the vessel was present among the grave goods. But light, as is the case with the tomb 3200, where they found two, stood upright, speaking of the readiness for ignition of the fire on it.

After placing human remains near the northern, southern and eastern walls (a bronze pot), or at the same time, another four people were thrown quite sloppy about the north-west corner of the pit. The position of their skulls, limbs and trunks of vertebrates suggests that the slain men before they took over the head and legs, lightly swinging, throwing into the grave. We emphasize that in all cases in this tomb, as well as in other pits (3225 and 3240) and the royal tombs (3200, 3230, 3220), where it was possible to identify people likely to have been poisoned (or smothered), as no trace of weapons is not fixed. Only after the people in the same north-west corner of the body before the allotted ass (No 1) were down two, and killed before the dogs (NoNo 6 and 7). One after the other. On the skeleton of a donkey No 2 were placed as two dogs (NoNo 3 and 4).

Dogs body 2 and 8 near the eastern wall, leaning against the wall, but their limbs are on the floor. They could be placed in such a

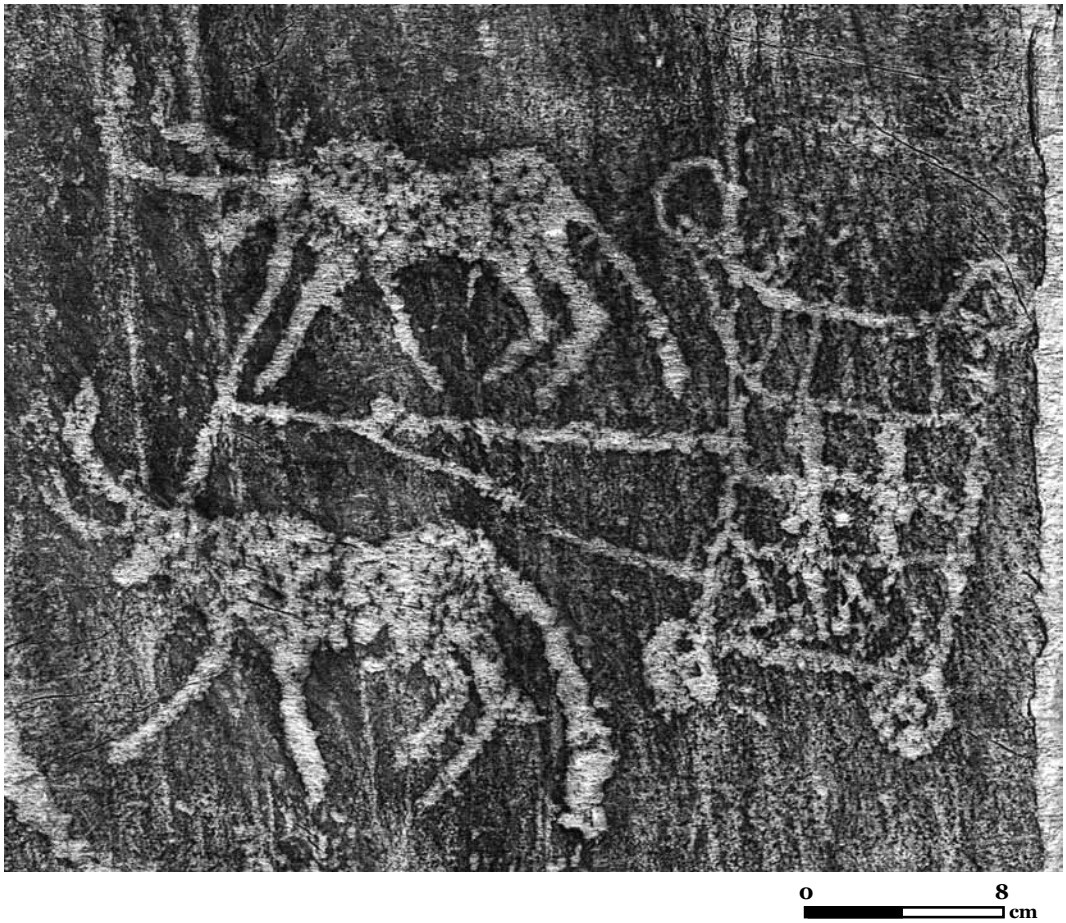


Fig. 8. Southern Kazakhstan. Kuldzhabasy. Photos from the micalent copy. «Profiling» image of covered wagon (van). The total size of the image is a little more than 30 cm in length, the distance between the lower wheels – 8 cm.

way at different times, but obviously after the stone staffs. It can be assumed that the dumping was carried out by several groups of people, the responsibilities of each of which consisted of different procedures: one to empty into the pit before the body of murdered animals, people, others – grave goods, and others to perform the rituals of killing, etc.

After making all the above burial pit was filled with clean sand to a height of 2 m at this level, in the western part the fire was set, next to a small building made of adobe bricks, and near the eastern wall of the pit is constructed disposal of another (the eighth) dogs. Not a funeral, or located on a 2 m deep skeletons of the same animals were not placed randomly. Dogs that have been buried near the wall on the floor (No 2 and 8) are placed at the sides as the dog No 1 and form between them something like a triangle standing upright, at the apex of which is buried, is located above all the animals. " [Sarianidi, Dubova, 2010, p. 144-171].

Burial 3130. Cyst, composed of adobe bricks, had dimensions of 230 by 125 cm, a depth of 25 cm contained three core rams: two adults and a lamb, 8 ceramic, two cylindrical bronze vessel, one of which was cosmetic porcelain bottle. Funerary offerings complement these animals three flint

arrowheads, placed in one of the vessels. On top of a rich set of bronze objects put pieces of meat of young camels.

In the back of the northern sheep put some bronze objects: a bottle of the cosmetic applicator in bronze, a large knife, mirror, and most importantly – two so-called "harpoons." One – the size of 49 cm with a silver handle, and the second – with the sharp end and a length of 65 cm

"Harpoons" of this type are known in Egypt, the Bible and the Syro-Palestine, as well as in Elam, and Bactria. Both the "spear" from the burial 3130 were carefully wrapped in tissue, as evidenced by the prints of it, preserved by the copper oxides. Although the purpose of such "harpoons" is unknown, have been noted such items in the hands of kings and gods in the Mesopotamian glyptic images [Dubova, 2004, p. 260].

Discussion and analysis: from the above authors description of evidence about the body of found wagons possible to speak only by fragments preserved remains of tree in burials 3200 and 3900, and in the first case, the wagon rolled in the "yard" of the tomb, and in the second case – dropped to the bottom from a height of more than 2 meters.

The assumption that its structure could collapse in the fall, it is unlikely, because in the course of its operation, it had to withstand much more damages. It is possible – axle and wheel separation in the fall, but not the destruction of the body. This is important because when clearing and the first and second wagons recorded significant difference of height of the upper edges of the alleged fixing "seats" on the floor or frame in the area of one of the axes for each wagon.

Thus, wagon from the tomb 3200, it rises by 60 cm, and the other wagon (from the grave 3900) – half a meter. Is it too high and uncomfortable seat for vehicles, the total length of the body which barely exceeds one meter and platform width (distance between wheels) – slightly more than 80 cm? (The distance between the axes in the first case – 1.1 m, the second – 1, 15 m). The height of these seats on the synchronous Novotitorovo's wagons, for example, does not exceed 30 cm, at much larger dimensions of the vehicle itself.

It may be that body considered Gonour's wagons were equipped with high protective front fascia above the front axle like in the ancient Near East, belonged to the type of "battle wagons" imprinted on the famous mosaic mural, "The Standard of Ur". However, battle wagons with high limber (front), as well as a wagon with a seat, used throughout the 3-d mill. BC in Sumer and Elam [Littauer, Crouwel, 1979]. From a practical point of view, the universal use of high-chuck seat is quite acceptable in the case of military threat – as a protective device, and during transportation – as the seat. Vehicles with high and low sides limber known in Anatolia (Alakahyuyuk, see resp. Section of this book). Judging by the size of the excavated Gonur's wagons, they were developed as a "military (battle) wagons" for the crew of one or two people, standing and seated on a platform similar to the image on the Bactrian silver vessel (Fig. 81).

The body structure dismantled by the wagon from the grave 3225 do not "seat" in the form of a narrow board, but rather – an extreme piece of the flooring of the main frame common open wagon of "platform" type with a low lateral rim (up to 5 cm), judging by the size of the parts. It is permissible to replace the entire body of his significant part of the well-known in the ancient principle (pars pro toto). However, the location of the "seats" along the long axis of the body carts and it is quite possible, judging by the image of the wagon from Kuldzhabasy. (See below).

Draught animals: independently from the shape of the body, it is clear that it was too heavy for a couple or four equids. Various equids – donkeys and half-asses – widely used in synchronous harnessings in the Near East. Materials of Gonur Tepe suggest the possibility of harnessing a pair of donkeys (Burial 3900), but their joint efforts to draught power was hardly sufficient for the efficient operation of such a heavy wagon. Horses must also be excluded from the list of draught animals, as osteological materials of the monument found only eight species of horses for more than 3 thousands of excavated graves – and this despite the fact that the number of horses in the steppe (Botai) monuments has hundreds if not thousands of heads. The most suitable candidates for the role of draught animals are the bulls (oxen) and camels. At the same time, the bones of bulls were found in graves with wagons, but they are well represented in the osteological materials originating from the sacrificial furnaces, and – on the contrary: the whole skeletons of Bactrian camels were found in graves with wagons [Sataev, 2008, p. 144-145, 138-160].

For example, in the tomb 3200 the burial of the skeletons found foal, camel, dog and sheep, in the burial 3225 – two camels (old and young, the old remains fixed between the humps – "seat") – and the horns of antelopes, gazelles, and in the burial 3900 – the skeletons of two donkeys, camels and two of eight dogs. Thus, a camel or a pair of camels – the most likely draught animals of Gonur's wagons.

Method of transmission of draught power: found in the burial 3900 fragments of two long poles 100 and 132 cm, the alleged "shafts" of wagon – are too short to be so. Of course, may be this is just part of them, surviving fragments. In other graves with vehicles no other accessories for draught power transmission of force from draught animals to a vehicle is not fixed, that was the basis for the authors of excavation involve the use of leather belts and ropes. This assumption is valid, if you remember these Indo-Aryan written sources (see resp. Section of this book) that mention the mounting straps fixed to the body axes of the wagons and the complex, or "A" – shaped, composite poles, sealed by ropes and straps. Judging from these data sources, draught power transfer options force draught animals (oxen) could be a lot, and they all involve the use of rawhide straps and ropes.

In the case of the Gonur's wagon likely to use one draught-animal – a strong and enduring camel – and the use of an innovative combination of short shafts and leather belts. The well-known clay model of a wagon with a sculptured (protoma) of a camel from the Anau-Tepe indirectly confirms this. Probably recorded in tomb 3225 the remains of "saddle" between the humps of an adult camel – there are remnants of devices such as slings, yokes of the horses, which were fastened seat belts these "shafts".

It is possible to use short "shafts" in the form "A"-shaped short draught-pole to which were harnessed by the belts a couple of draught animals. In this case, it might be tongue-shaped «Y», similar to that shown in a silver vessel from Bactria, and often encountered in the petroglyphs of Central Asia with the wagons. However, these poles (assuming that they were actually longer than that recorded in the tomb fragments) can communicate with each other belts and the letter "T", in this case – is a central draught-pole for a pair of draught animals – camels, it is which is shown in Baikonour's wagons (see the vehicle's typology).

Northern iconographical monuments (petroglyphs), originating in the steppe and semidesert areas of Kazakhstan and Uzbekistan – Baikonur, Karatau, Tamgaly Kulzhabasy, Sarmyshsay, Bukantau –

Fig. 9. Southern Kazakhstan. Kuldzhabasy. Photo of plane 362 and the wagon. [Sala, Deom, 2005, p. 91, fig. 7.7; Samashev, Chang Co Ho et al, 2011, p. 372].

shows developed cult of the camel in these areas (along with the cult of the horse), and demonstrate different ways of harnessing as a pair, and one camel. In the latter case highlighted a combined method of harnessing.

A.E. Rogozhinskiy identifies a number of subjects, imprinted on the rocks of southern Kazakhstan petroglyph sites, similar to the materials from Gonur's tombs, and the resulting set forth correspondences in the petroglyphs [Rogozhinskiy, 2011, p. 87-99].

Focus on another important observation V. I. Sarianidi, expressed on the construction of Gonur's wagons [Sarianidi, 2008, p. 168]. In describing the findings in the tomb of 3200, the author draws attention to the three graceful figures of falcons, and based on the findings of one of them in close proximity to where the wagon set, suggests that they may adorn, for example, the canopy of the wagon. Covered wagon – not uncommon in this period, and the presence of light protection from the scorching rays of the sun – an urgent need in the area.

Here, in this regard recently found in the mountains of Kuldzhabasy (Southern Kazakhstan) image of four-carts, drawn by a pair of oxen [Sala, Deom, 2005, Fig. 9]. Author of copy of the image, to A.E. Rogozhinsky I was kindly handed (Fig. 8).

As can be seen in the illustrations, draught animals – a pair of oxen – are shown in the position of "one over the other," the wagon is equipped with "A" shaped draught-pole and it would seem, the wagon is displayed in a standard "planning" projection, as evidenced by the "wheel" in the top of the image. However, upon closer inspection, the wheels of the wagon turns out that the lower the wheels made a solid knockout, and transferred to the upper pair of contour lines and is located too far from the body of wagon. In the carriage sat two men pictured sideways while moving vehicles, as evidenced by their feet are shown. It turns out that the way the image and the overall angle of the vehicle shows "profile" picture light awning covered wagon with round tops.

In general, the image is strongly reminiscent of wagon draught by oxes, on the stele Znamenskaya in the Minusinsk Basin. Perhaps, on the rocks Kuldzhabasy captured yet another example of the spread of the Near East's profile manner presentation of the vehicles in the rocks of Central Asia.

Returning to Gonur's wagons, highlight the main features of the burial ritual, associated with them:

• structurally the Gonur's funeral rites with vehicles much the same as for the most basic items with the selected "iconic number (serie)" in the petroglyphs (joint burial of dogs, gazelle horns, ect);

• has structural similarities to the simultaneous burial of wagons from the northern steppe regions (early stage of Novotitorovo culture);

• definitely are two different burial traditions: installation of an entire wagon to the grave (3200, 3900) and placing it in a disassembled form – "imitation" of funeral carriage (3225);

• apparent elitism of these burials;

• using for the walls of the tomb adobe bricks, clay of various device platforms and funeral fires;

• human sacrifice;

• burial accompanied by cults bronze sacrificial vessels – a steady tradition of their manufacture;

• developed a cult of the dog;

• the emerging cult of the horse;

• the cult of the fish (found amazing painted with red paint figurines of fish);

• presence of "attributes of power" – broken stone staves, stone disks, sceptres, "harpoons";

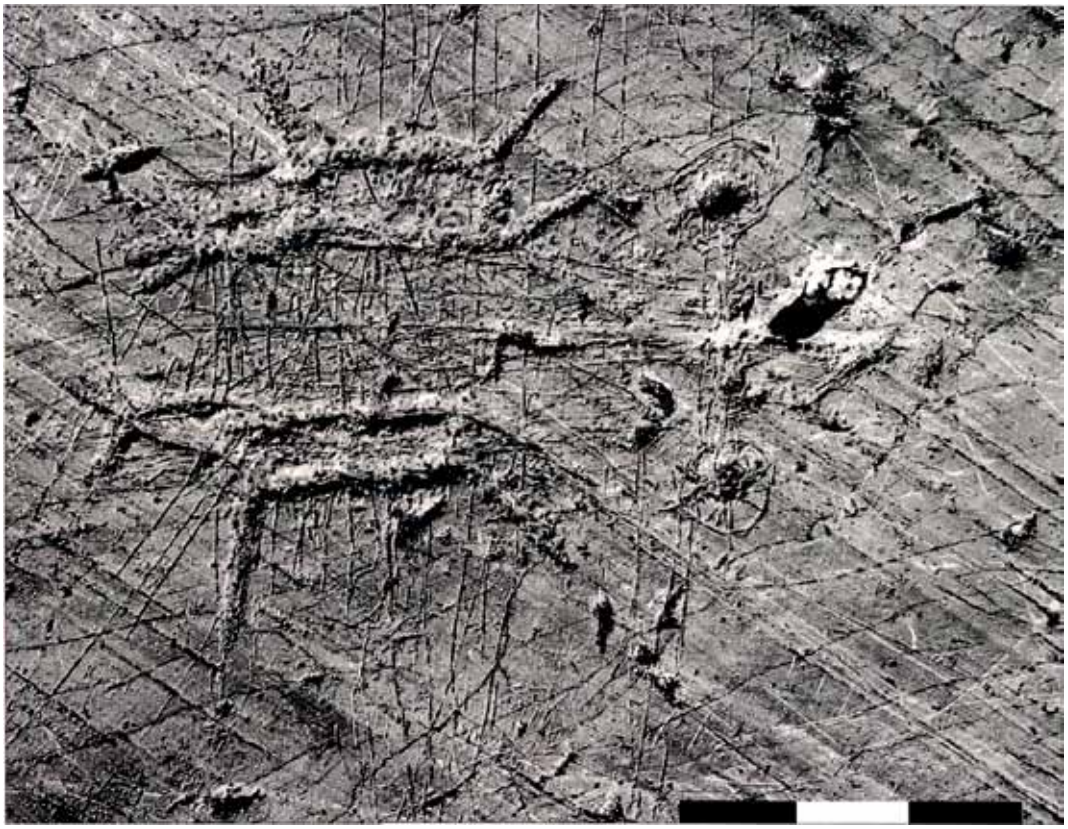


Fig. 9A. Gorny Altai. Elangash. Photo.[Cheremisin, 2011, p. 146-160].

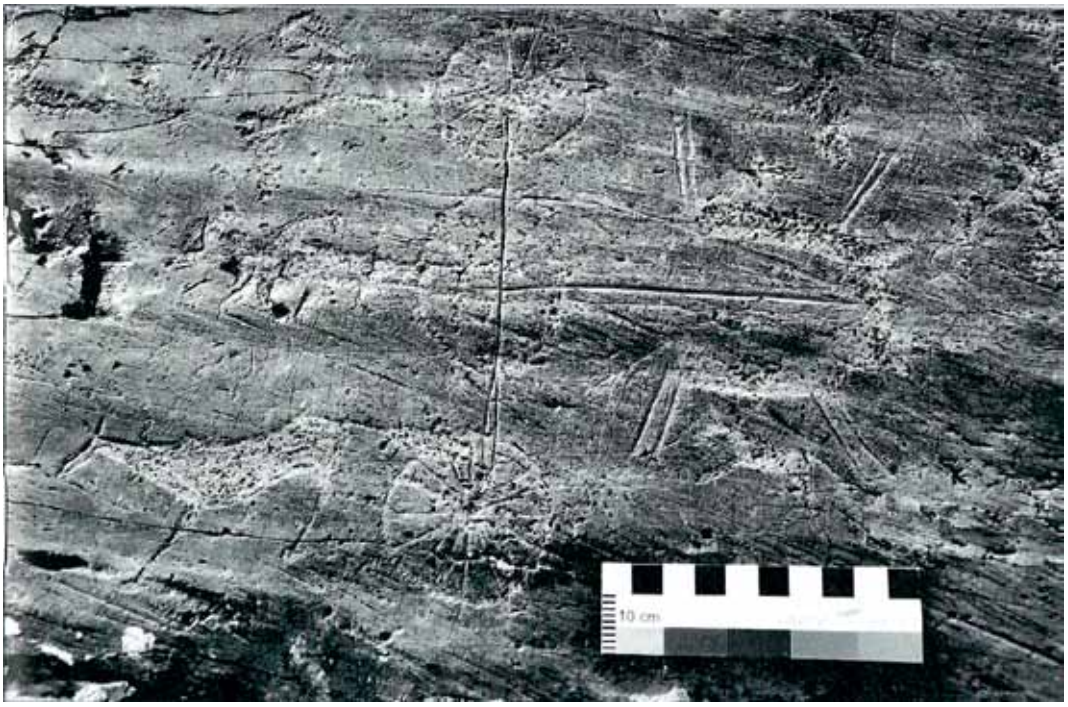


Fig. 10. Gorny Altai. Elangash. Photo.[Cheremisin, 2011, p. 146-160].

• a special signal tubes (for training horses?)

• striking resemblance to the accompanying equipment, later identified as chariots complex of weapons, namely the numerous flint and bone arrowheads, "L"-shaped bronze objects – "harpoon"- goads (perhaps such items became the prototype of the hook from Aschisu); elongated bony plates with holes along the edges of the protective shell (Kamennyi Ambar 5, Rostovka) – in the Gonur's material these plates are made of ivory, and richly ornamented, decorated axes and handles of daggers.

All elements of the above "gentlemen set" are development and its striking parallels to the Early Andronovo's chariot burials of the Ural-Kazakhstan steppes, described in the third chapter of this book.

The similarity of this findings may indicate of the powerful Southern Innovation pulse in the Turanian communication channel, which took place in the last century of the third millennium BC and had a significant impact on the cultural genesis of Andronovo society, conditioning its difference from the synchronous Abashevo and Srubnaya communities that have developed up to that time on in a joint Pit's-Afanasievo cultural basis.

Thus, in the Ural-Kazakhstan steppes was a connection descendants of northern and southern branches of the migrants of the "first wave", who had apparently a common ancestral home (mother-land) in Northern Mesopotamia or in Anatolia at the beginning of the third millennium BC, which, of course, have changed both culturally and linguistically since then, having absorbed the many traditions and customs of the indigenous societies through their local wives.

The symbiosis of the most advanced innovations for its time, namely, success in the domestication of the horse, the progress in the development of horse bridle, a technique of casting socketed

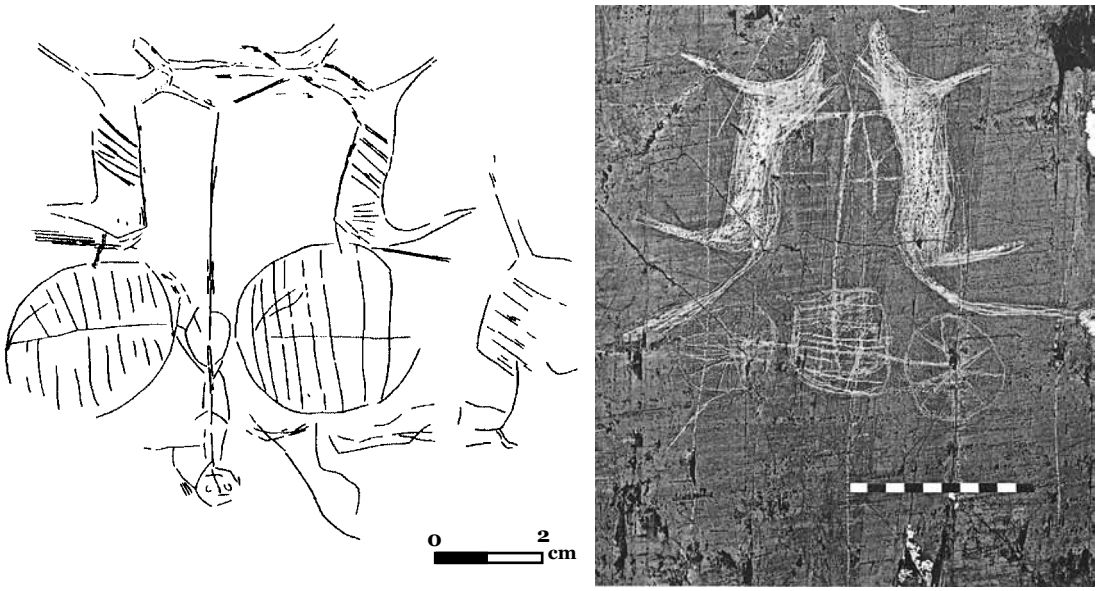


Fig. 11-12. Gorny Altai. Chagan. Drawing (11) and modern renovations. Photo. (12). [Cheremisin, 2011, p. 146-160].

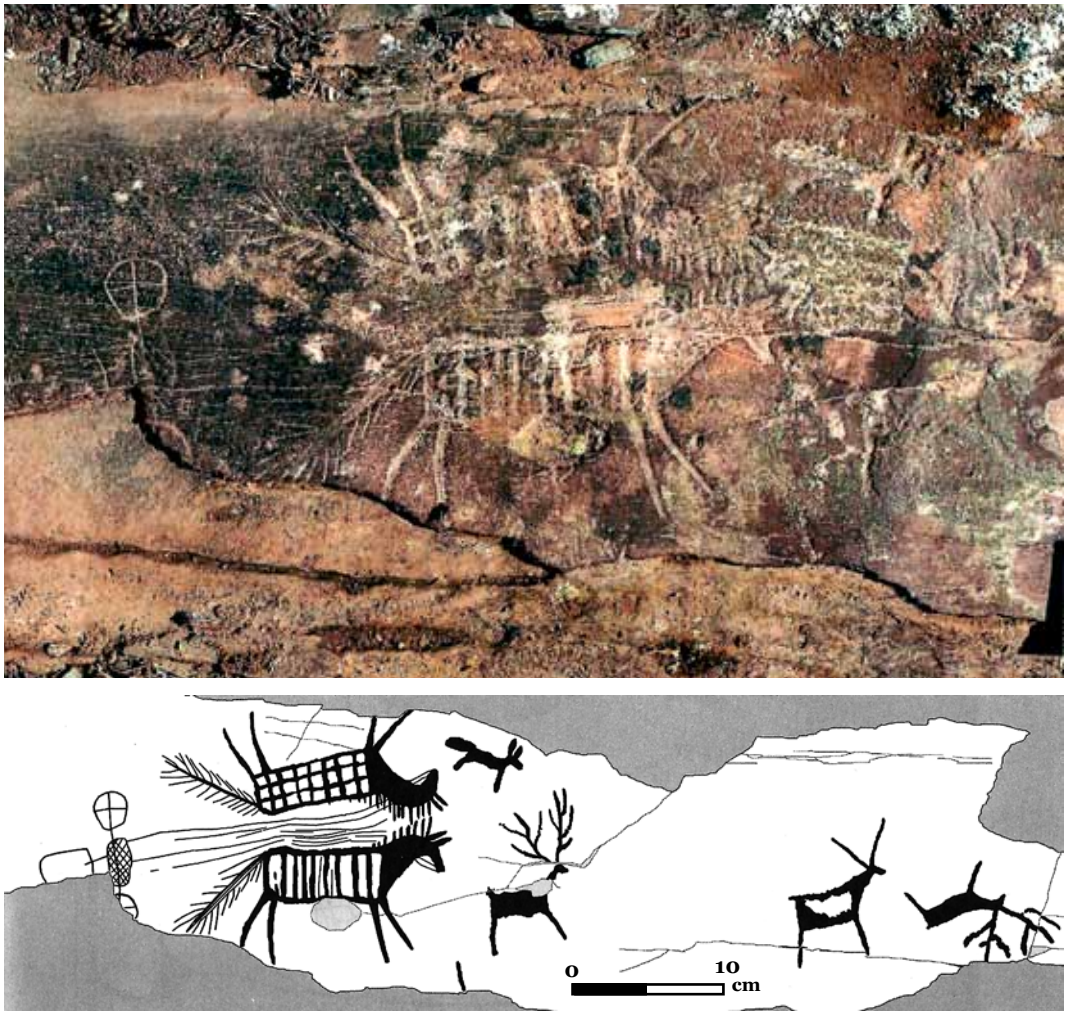


Fig. 13. Gorny Altai. Kalbak Tash. Photo and drawing after the removal of lichens. [Miklashevich, Muhareva, 2011, p. 233-246].

bronze weapons (Seyma-Turbino), advanced manufacturing skills of wheeled vehicles – occurred in the Ural-Kazakhstan steppes in the late third and second millennium BC, led to the invention of war chariots, and it has become a powerful "communicator" with which Early Andronovo's clans were able to provide its considerable territorial expansion.

The appearance of the Ural-Kazakhstan steppes of outstanding monuments like Archaim and Sintashta – an obvious result of such interaction.

Already in the 19-18 cent. BC., thousands of kilometers from the main core of the addition of Andronovo culture, far to the south – in the Zardchhalifa (elite tombs with the psalii and funeral chariot) – and the fertile oases of BMAC, active penetration fixed and there are whole Andronovo settlements around the oases of these – for example, Tahirbay [see Porpola, 2006, c. 184-188; Babomulloev, 1998; Gubaev, Koshelenko, Tosi, 1998]. It is possible that a large fire in the Gonur's Kremlin in 19 (18) cent. BC also associated with this Early Andronovo expansion.

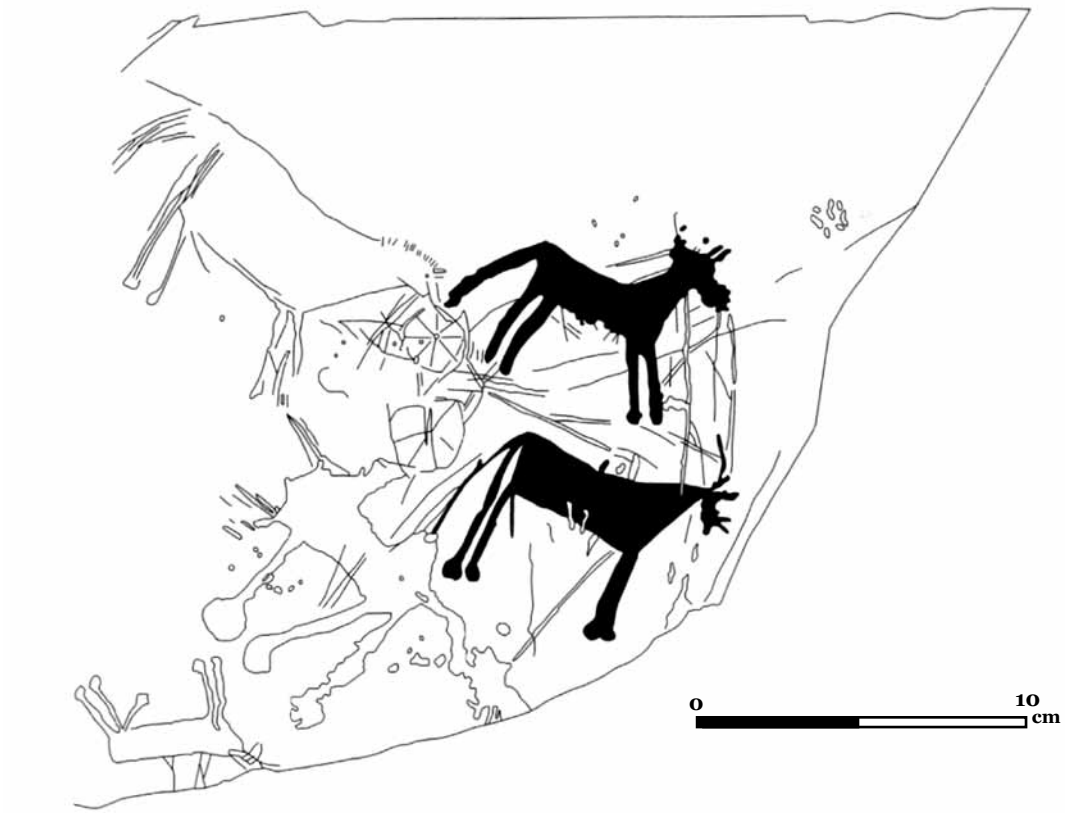


Fig. 14. Southern Kazakhstan. Eshkiolmes. The plane 177. Photo and drawing. [Samashev, Chang Ho Co et al, 2011, p. 238].

Age of chariots (2-1mill. BC)

Rapid advances in digital photography, the active use of new materials for copying the petroglyphs on rocks greatly improve the quality of the modern copies of rock paintings and lead to a revision is published, entered into scientific images of chariots. For this reason, hereinafter in this section will give a series of new photographic images of chariots and their sketches.

In addition to the above circumstances, the progress in the technique of copying from the rocks in recent years has revealed a series of not noticed previously by researchers thumbnails chariots made the rocks very fine carved lines in the technique of "graffiti". The amount of such images, and sometimes do not exceed 10 cm is found significant series of petroglyphs in Altay, in Eshkiolmes (valley of Koksu river, Southern Kazakhstan) and in the Pamirs [Cheremisin, 2007, 2011, p. 146-160; Miklashevich, Muhareva, 2011, p. 233-246; Sala, Deom, 2005, p. 122, fig. 10.8-9; Samashev, Chang Ho Co, Bokovenko, Murgabaev, 2011; Ranov, 2001].

Dmitry V. Cheremisin registered representative series of such images on the banks of the rivers Elangash and Chagan in the Altai [2007]. The author notes multiple instances of a combination of techniques of engraving and spot a knockout. In this small and important details are often referred chariots carved with thin lines. The author is convinced that such a complex for the knockout image as a chariot, preceded by an engraved sketch.

In Elangashe, in the small image of chariots, ancient author adapted the circular natural depression in the rock, and, taking him by the axle, painted around the engraved sketch of the chariot, and then worked for a knockout spot shapes of horses (Fig. 9). In a similar manner, and made another miniature image of the chariot on this monument (Fig. 10).

On the rocks on the banks of Chagan river similar images are preserved in the original (Fig. 11) or heavily patched-modern "colleagues" form (Fig. 12) [Cheremisin, 2011, p.148-150].

On the other well-known monument of Altai – Kalbak-Tash [Kubarev, 2010; Kubarev, Jacobson, 2006] as a result of the work to clear image of the lichens in the 7th Group of the monument above the 398-406 planes with chariots found a unique image, performed a combination of techniques point knockout, engraving and polishing (Fig. 13). Thin engraved lines show the grid platform, the tails of horses, the reins. Impressively shows the mane and ears of the horses. But the main feature of this image – an unusual filling of the torso harness horses, in one case – a "cell", while the second horse – is parallel to the vertical strip [Miklashevich, Muhareva, 2011, p. 233-246].

In Eshkiolmes also known similar miniature chariots (Fig. 14-16).

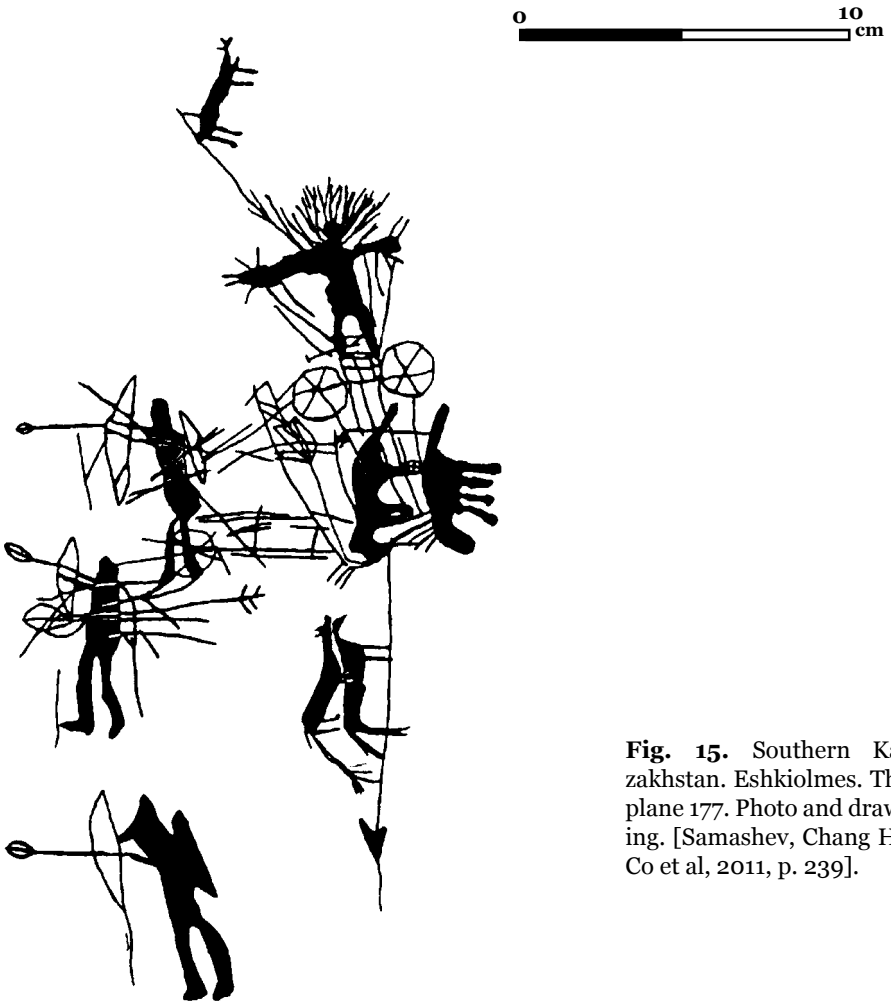


Fig. 15. Southern Kazakhstan. Eshkiolmes. The plane 177. Photo and drawing. [Samashev, Chang Ho Co et al, 2011, p. 239].

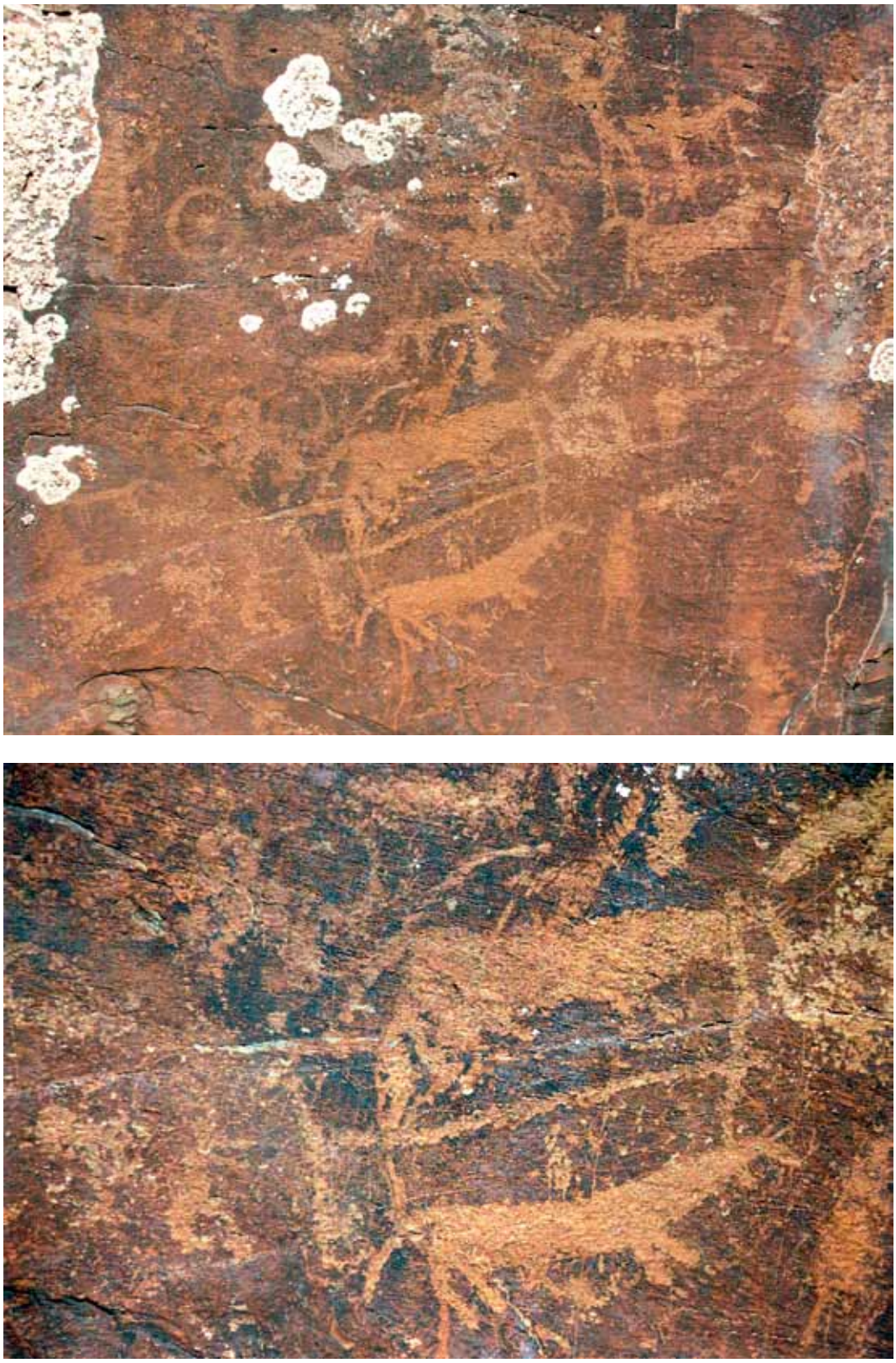


Fig. 16. Southern Kazakhstan. Eshkiolmes. The plane 202. Fragments. [Samashev, Co Ho Chang et al, 2011, p. 254].

Fig. 16A. Southern Kazakhstan. Eshkiolmes. The plane 202. Drawing. Fragment. [Samashev, Co Ho Chang et al, 2011, p. 255].

Images of the chariots of the Southern Kazakhstan

Fig. 17. Southern Kazakhstan. Tamgaly. Photo. [Samashev, Co Ho Chang et al, 2011, p. 315].

Fig.18. Southern Kazakhstan. Kulzhabasy. The plane 323. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 340].

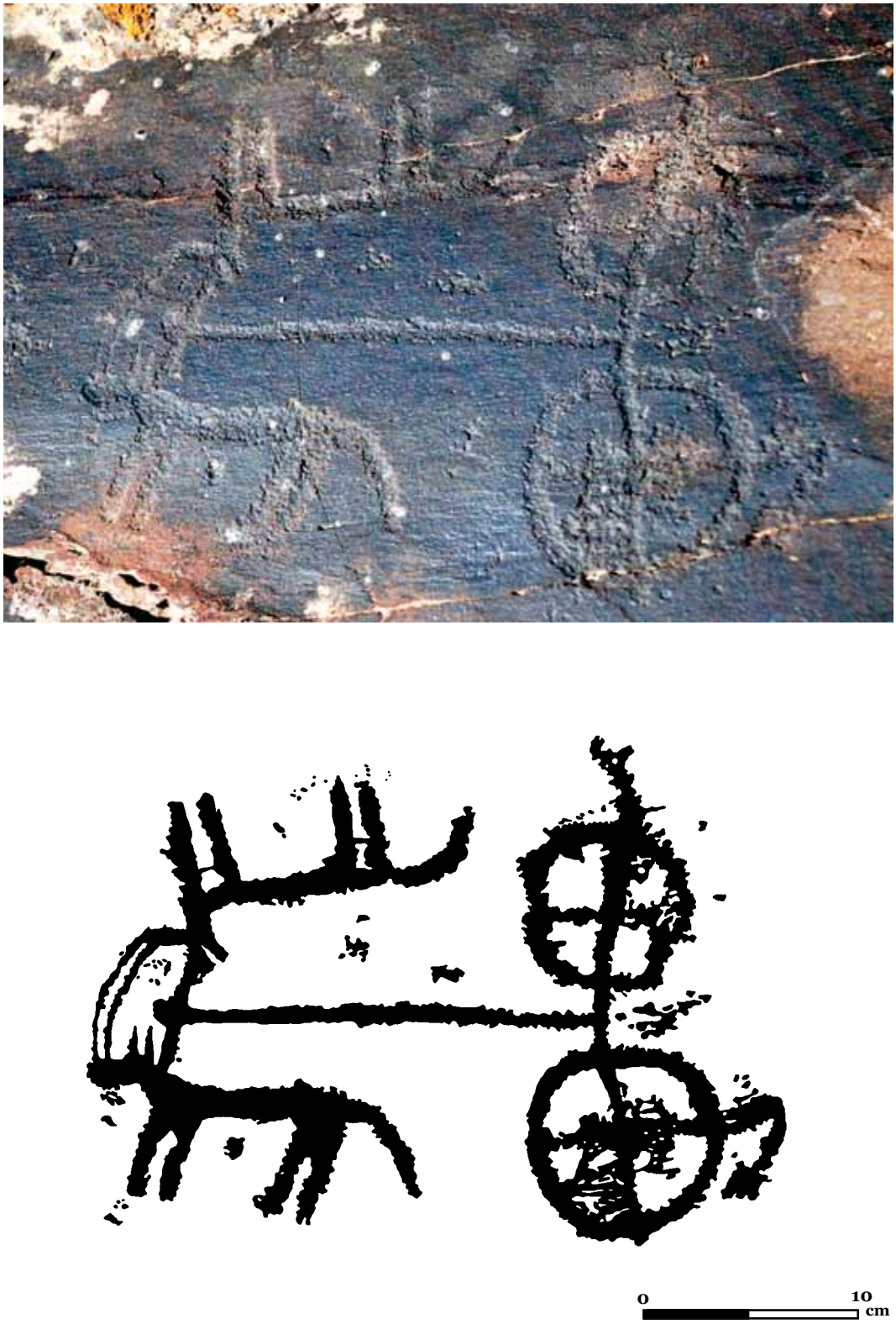
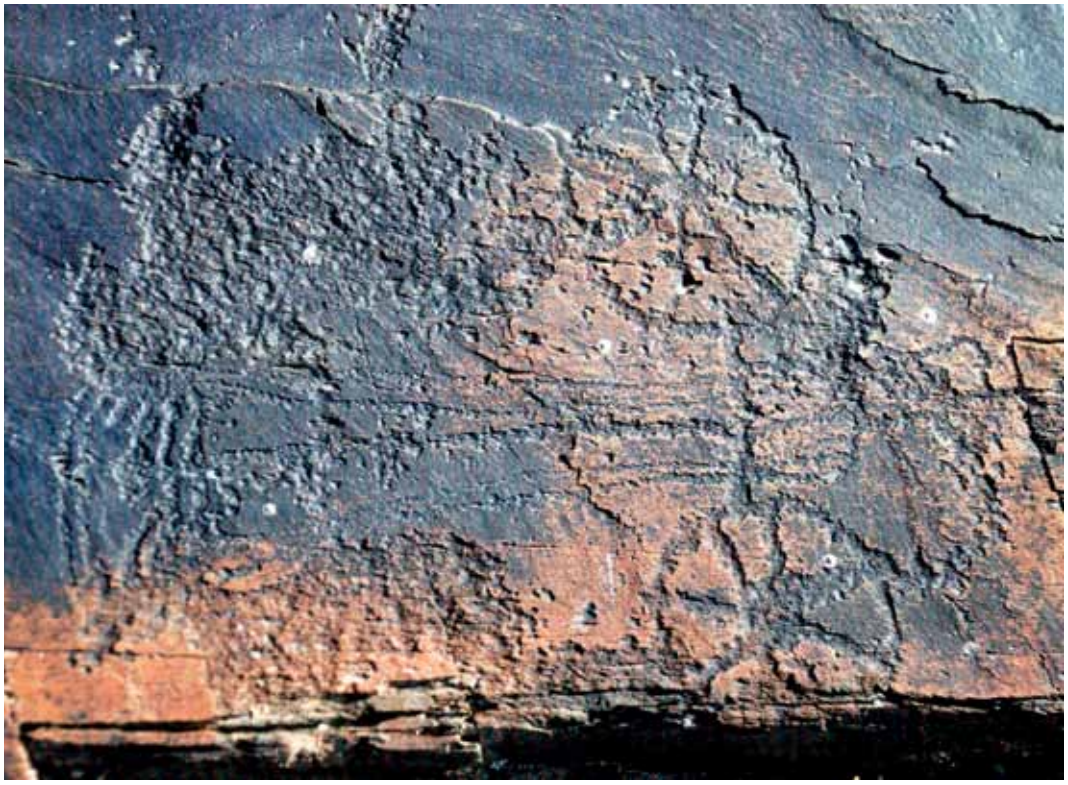


Fig. 19. Southern Kazakhstan. Kulzhabasy. The plane 326. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 342].



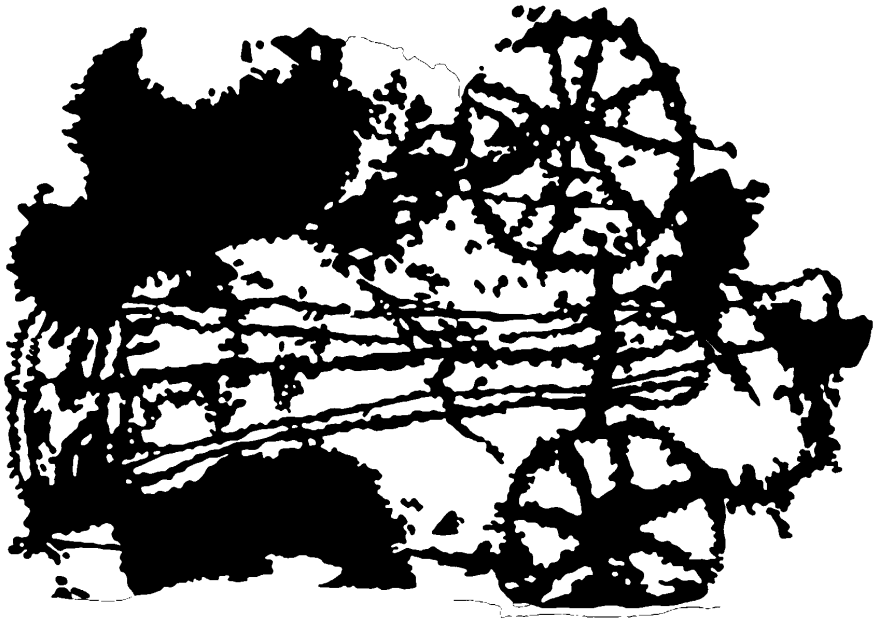


Fig. 20. Southern Kazakhstan. Kulzhabasy. The plane 327. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 343].

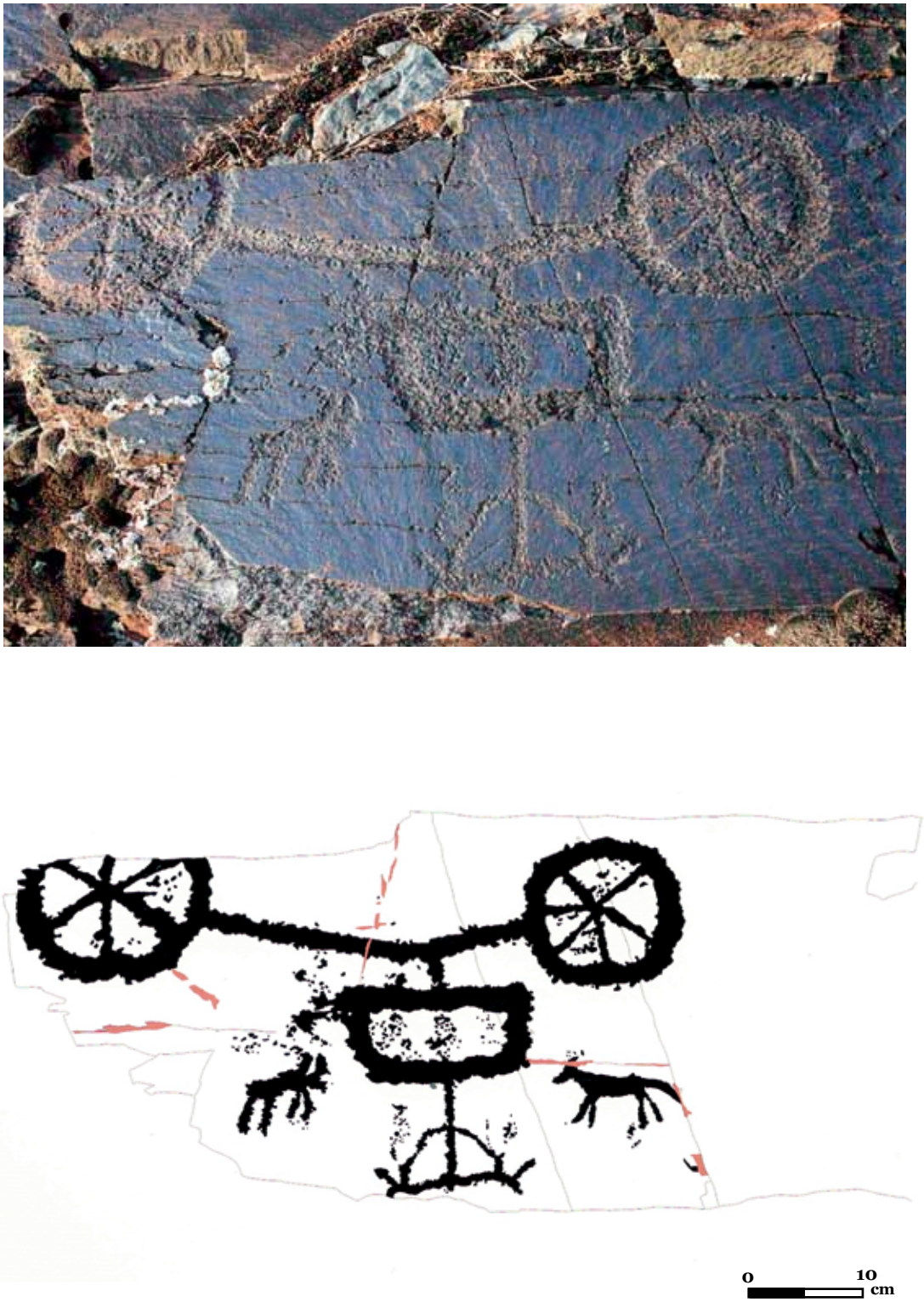


Fig. 21. Southern Kazakhstan. Kulzhabasy. The plane 329. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 346].

Fig. 22. Southern Kazakhstan. Karatau ridge. Arpauzen. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 420].

Fig. 23. Southern Kazakhstan. Karatau ridge. Arpauzen. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 421].

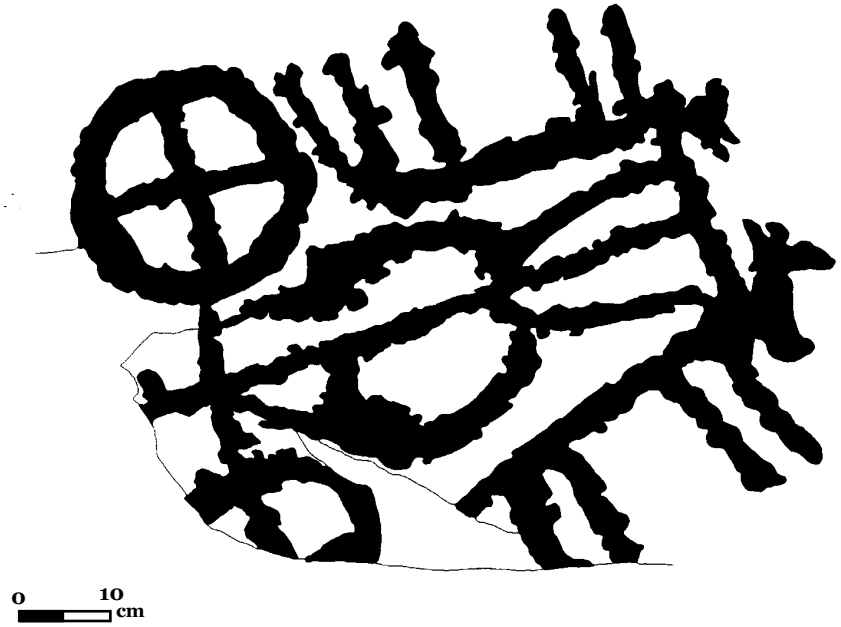


Fig. 24. Southern Kazakhstan. Karatau ridge. Arpauzen. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 423].

Fig. 25. Eastern Kazakhstan. Groth Akbaur. Photo. View inside the cave and the cart. [Samashev, Co Ho Chang et al, 2011, p. 71, 115].

Fig. 26. Eastern Kazakhstan. Moinak. The plane 33. Photo (detail) and the drawing. [Samashev, Co Ho Chang et al, 2011, p. 134].

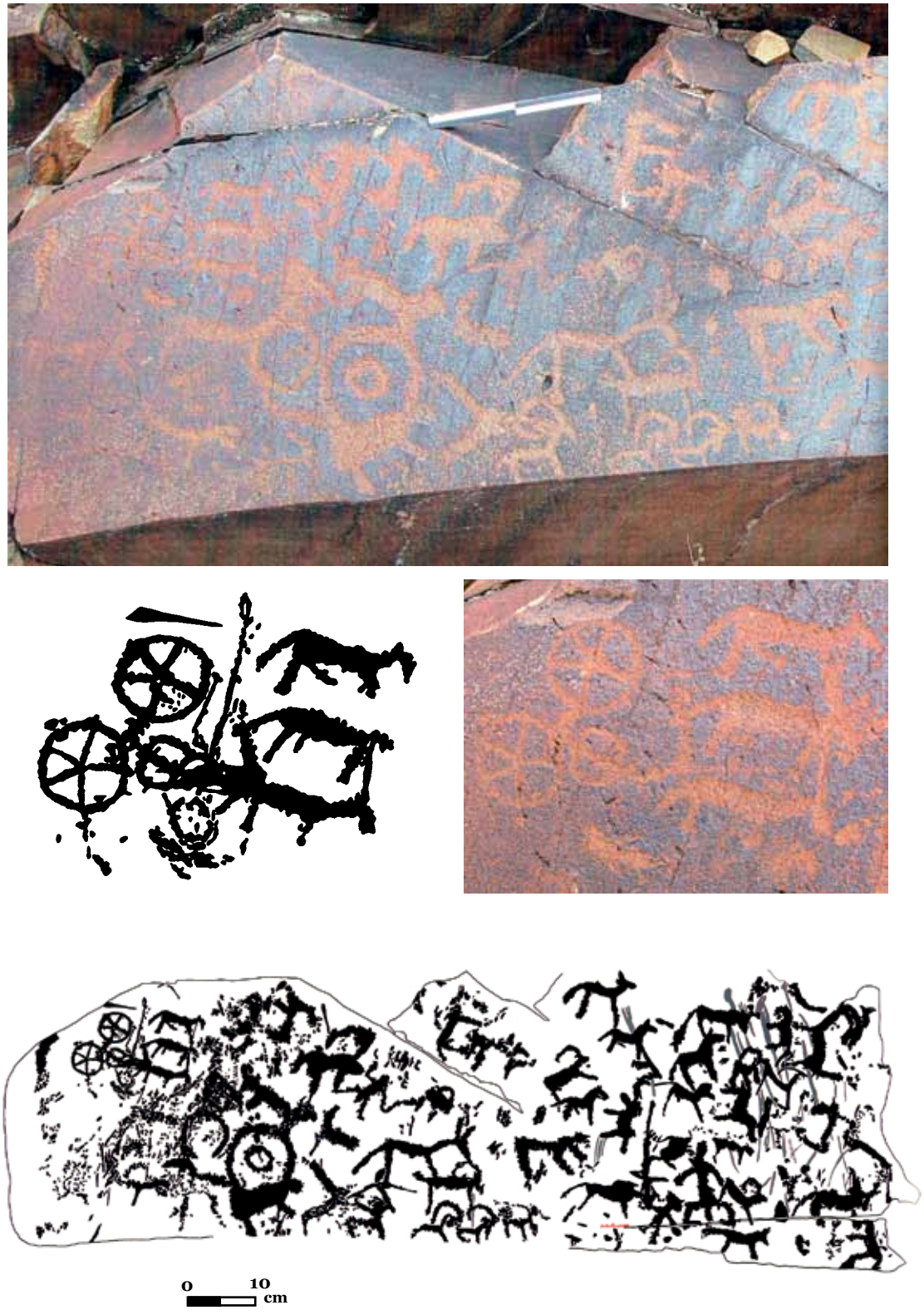


Fig. 27. Eastern Kazakhstan. Moinak. The plane 37. Photo and drawing. Fragment – the chariot with the upright spear. [Samashev, Co Ho Chang et al, 2011, p. 138-139].

Fig. 28. Eastern Kazakhstan. Dolanaly. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 159].

Fig. 29. Eastern Kazakhstan. Tulkune. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 174].

New finds of chariot petroglyphs from Tuva

Review of new finds images of chariots from Tuva M.E.Kilunovskaya published [2011, p.44-53]. The author presents data on 25 well-known images in the region and describes the newly found compositions with chariots (Fig. 30).

"Stone Compass" (Ustyu-Mozaga) separately on a large rock lying horizontally on the left bank of Chinge river, at the foot of the mountain-Ustyu Mozaga, discovered a large multi-figure composition with 3 chariots [Devlet, 2004]. One is stamped on the segregated section of a crack rock (Fig. 31: 1). It was shown the curved yoke chariot and very schematically embossed horse. Next – a couple of goats and three signs in the form of horses' hooves [Kilunovskaya, 2011, p. 47].

Dogee – in the south-west plane of a large boulder, which is located next to the mountain Dogee [Kilunovskaya, 2007], found multi-figure composition with a hunting scene, a number – on the northern edge of stone – carved two images of

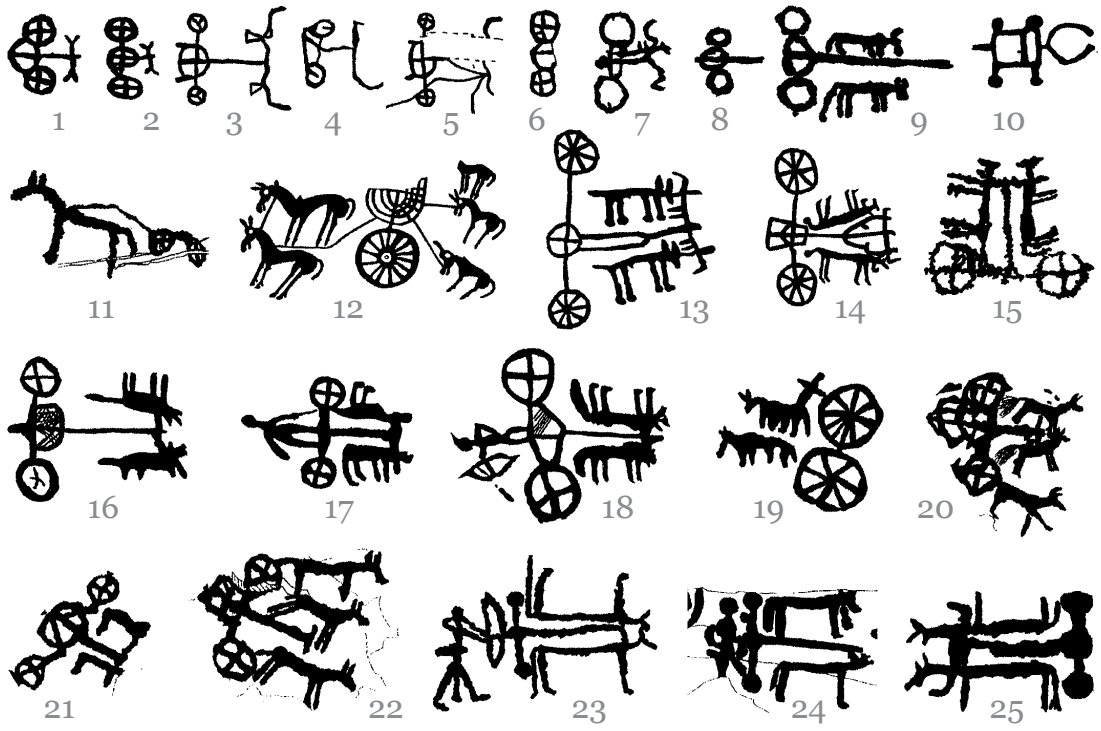


Fig. 30. Tuva. Images of the chariots: 1, 2, 10 – Mugur Sargol; 3-6-Ortaa Sargol; 7, 16-18 – «The Stone Compass»; 8,9 – Dogee; 11,13,14 – Aldy-Mozaga (left bank of Chinge); 12 – Arzhan 2; 15 – Syyn Churek; 19 – Ustyu-Mozaga; 20-22-Mortuk; 23-25 – Chaylag-Khem [Kilunovskaya, 2011, p. 45, fig. 1].

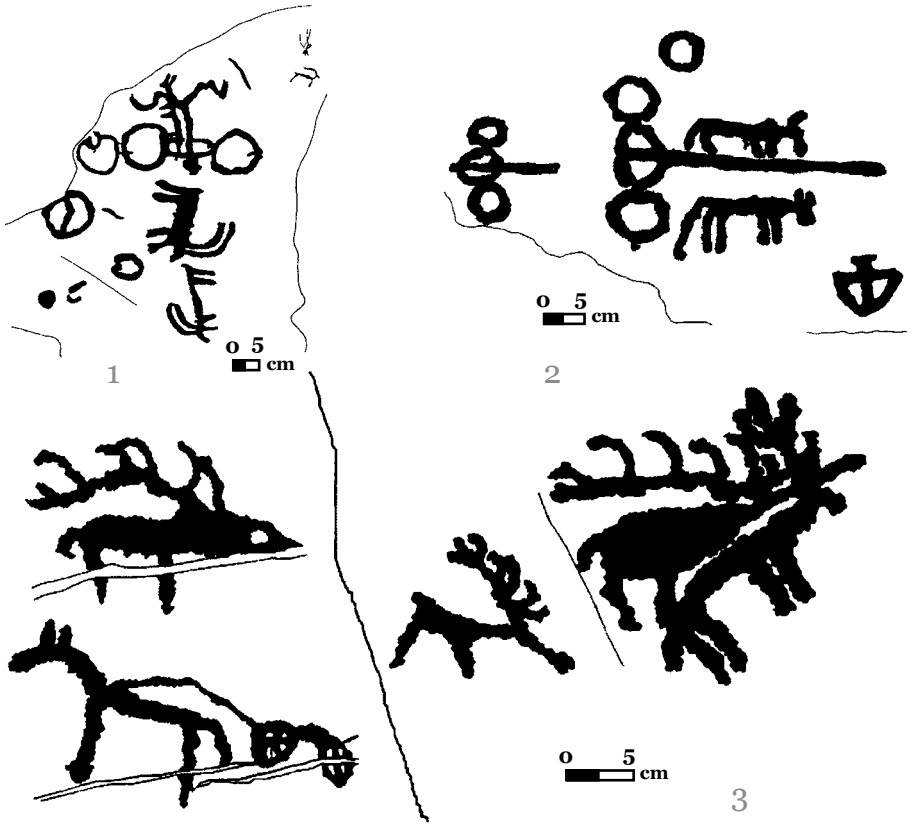


Fig. 31. Tuva. 1 – «The Stone compass»; 2 – Dogee; 3 – Aldy-Mozaga. [Kilunovskaya, 2011, p. 46, 48, fig. 2,3].

chariots, with a straight pole, oval body and wheels without spokes. Next to a pair of chariot horses shown in the position of "one over the other," and, perhaps, – the image of the vessel (Fig. 31:2).

Aldi-Mozaga (Chinge) – on a separate rock ledge on the mountain- Aldi-Mozaga, on the right bank of the Ulug-Khem river, in the Sayan pipe found "profile" image of chariot (Fig. 31: 3) in conjunction with a deer with "beak-shaped" snout. Earlier from this monument has published images of 3 chariots [Devlet, 1980, 1998].

Mortuk – on the western spur of Mount Mortuk, located on the left bank of the South Torgalyk, open rocky plane of the three chariots, following each other (Fig. 32). The peculiarity of this composition – the crotch as shown in the two horse chariot (triga) and worked fine carved lines, harness horses tails of first chariot.

Chaylag-Hem – on the northern slope of East Tannu-Ola, in the basin of Elegest river. Revealed three different compositions with the participation of chariots (Fig. 33). [Kilunovskaya, 2011, p. 44-53].

Plates with images of the chariot burial

Arzhan 2. The excavations of the funeral-memorial complex revealed a unique undisturbed burial of nomadic elite, and four deer and 34 stone plates with petroglyphs. The monument is definitely attributed to Aldy-Bel' culture and dated, including radiocarbon methods, middle – second half of 7th c. BC [Chugunov, 2011, p. 53].

In the undisturbed mound construction fence in the south-eastern sector of the fence panels detected plate 10/02 with a chariot petroglyphs (Fig. 34). The author suggests that the board had beaten out the petroglyphs and got here with the other stones from the quarry – a rocky outcrop with carved petroglyphs on it – located in 2 km north-east of Arzhan 2.

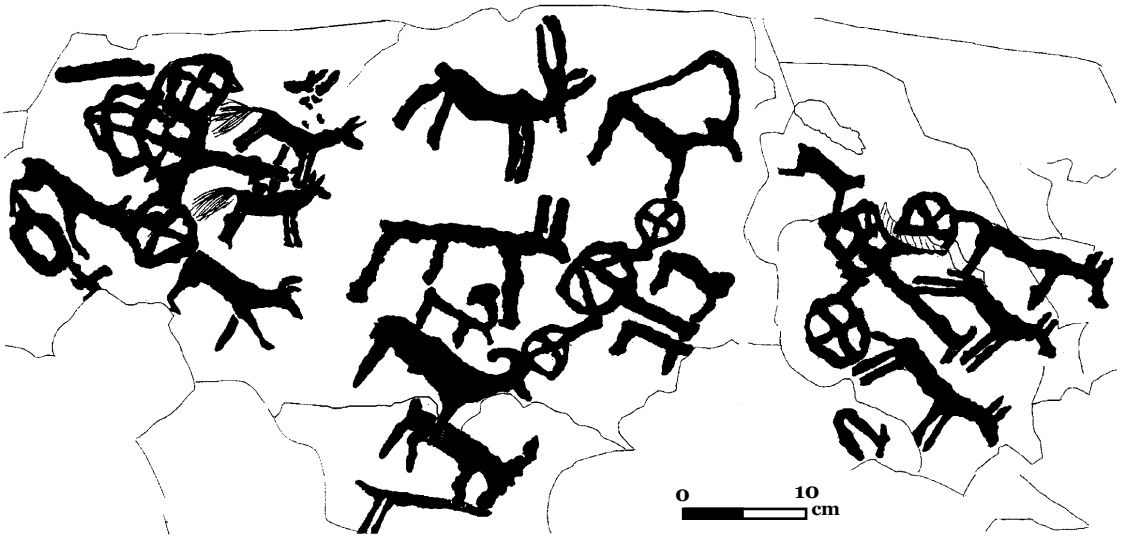


Fig. 32. Tuva. Mortuk. [Kilunovskaya, 2011, p. 49, fig. 6].

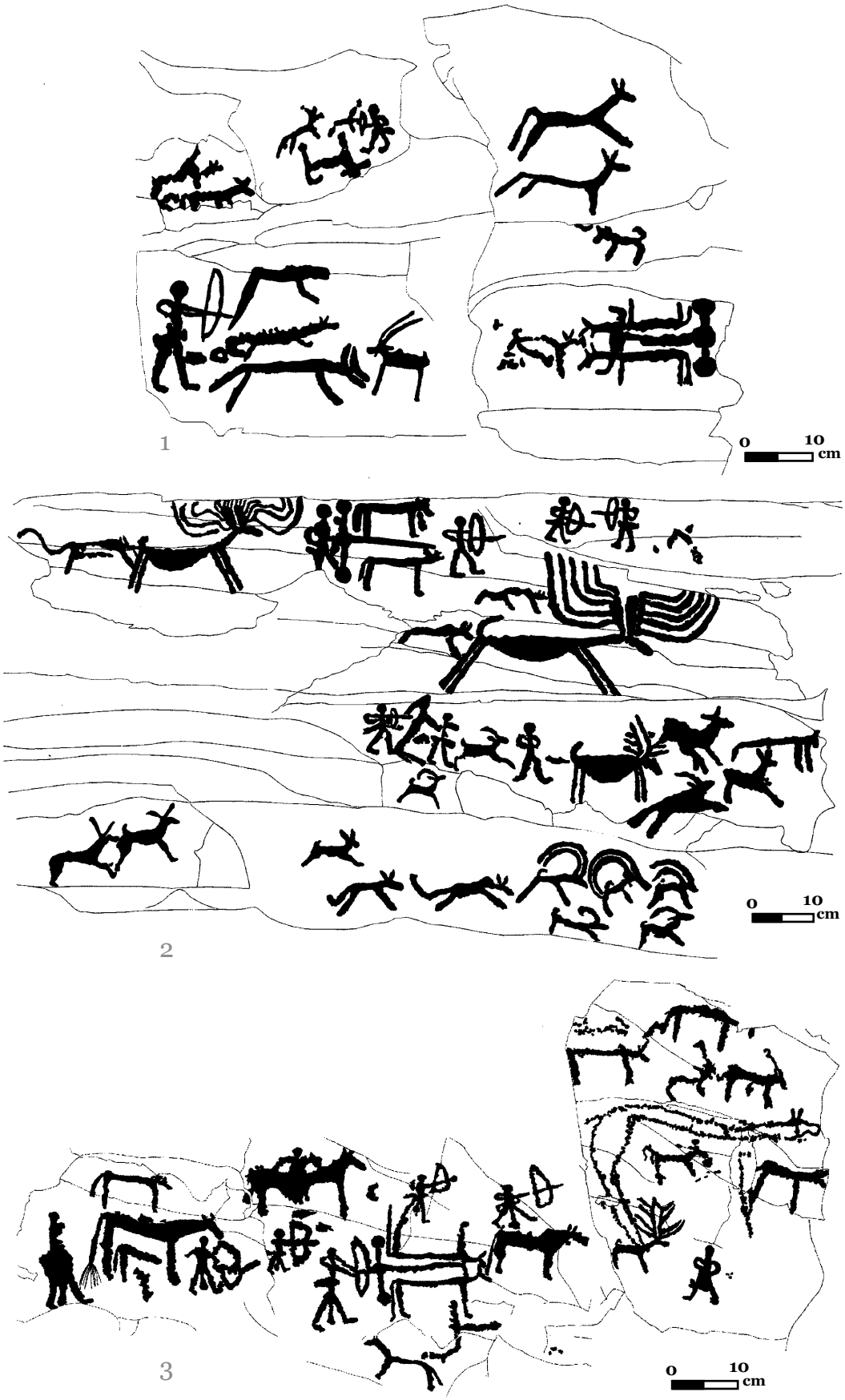


Fig. 33. Tuva. Chaylag-Hem. 1 – the second log, group 9; 2 – the first log, group 4; 3-second log, a group 6 [Kilunovskaya, 2011, p. 51, fig. 7].

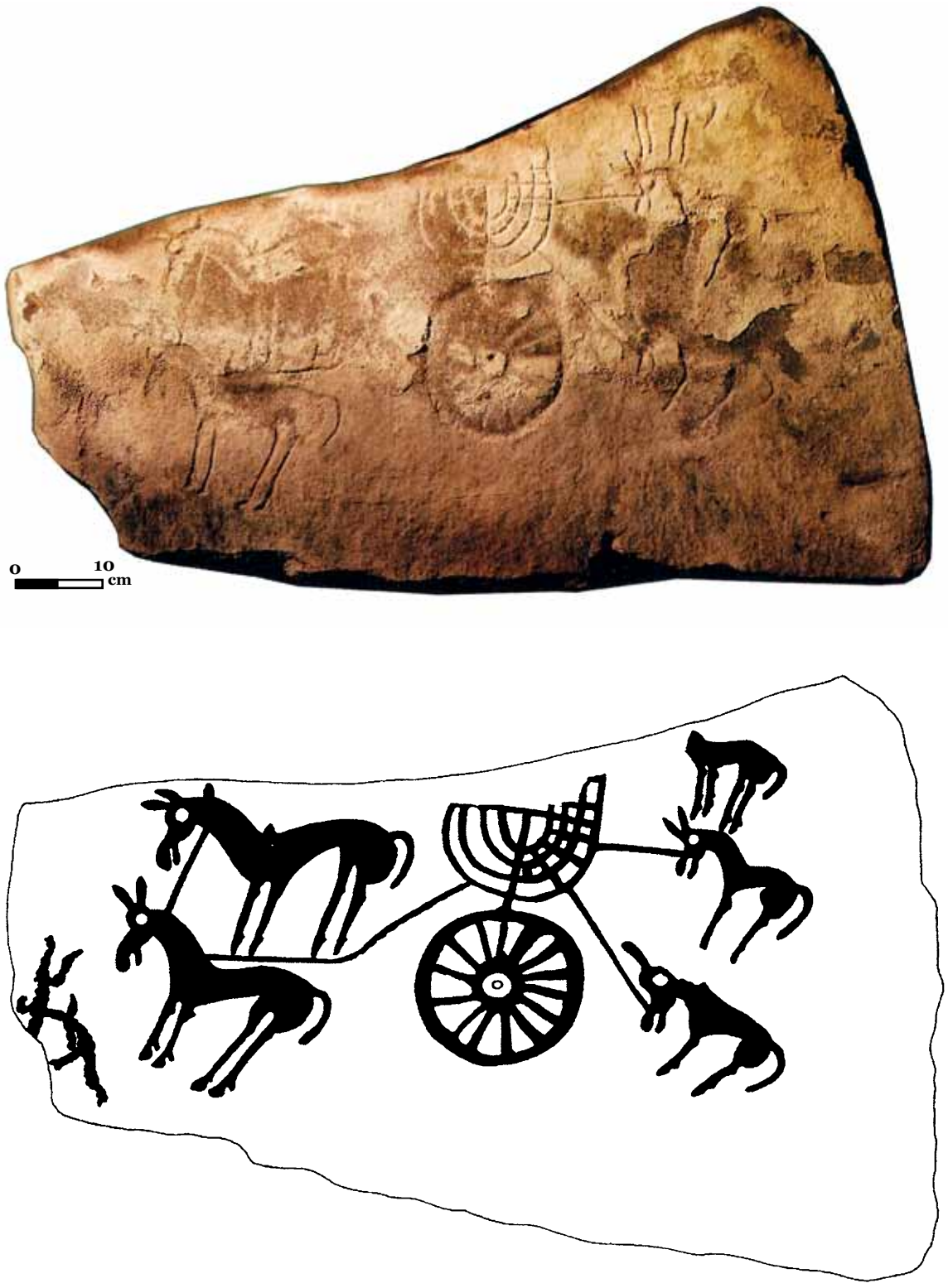


Fig. 34. Arzhan 2. Plate 10/02 from the south-eastern sector of the fence. Photo and drawing [Chugunov, 2011, p. 53-65].

In plate 10/02 was lost the upper part, which does not reliably judge the design of the vehicle itself.

Keep a track of the chariot on the basis of stylistic analysis of harness horses attributed to Arzhan-Mayemir style and dates from 9-8 cent. to the beginning of 7-th cent. BC [Chugunov, 2011, p. 65].

Age of chariots: the final (second half of 1 mill. – end of 1 mill. BC)

The cemetery Esino 5. In the south of Minusinsk basin, near the village of Poltakov (Askiz region in Khakassia), on a high stone of Tagar fence corner unexcavated burial mound, found images of vehicle [Savinov, 2002, p. 27-30].

The image (Fig. 35) is located in the upper part on the outside of the massive flat slab of red Devonian sandstone, height approx. 2.5 m. Size, knocked a large dot technique – 60x36 sm. There are many undetectable images.

Barrow is tentatively assigned to the Tagar culture, Podgornovo stage, and dated by 6-5 cent. BC. This image and its analogies confirm the author's opinion, "the western part of the population in ancient Kazakhstan participate in the formation of Tagar culture, which has been repeatedly noted by researchers" [Savinov, 2002, p. 30].

The cemetery Tsaram. Located in the Trans-Baikal, 1.5 km south from village Naushki (Buryatia). Belongs to the rare archaeological sites left by the Asian Huns (Hunnu), and identified by researchers with the burials of the nobility. The largest burial mound – № 7, in the central burial pit at a depth of 10 meters, fixed the remains of tent covered chariot (Fig.36-37) [Minyaev, Sakharovskaya, 2002, 2007, p. 130 – 137].

The construction of the chariots, broken in two predatory moves, recovers well enough: a small rectangular grid platform,

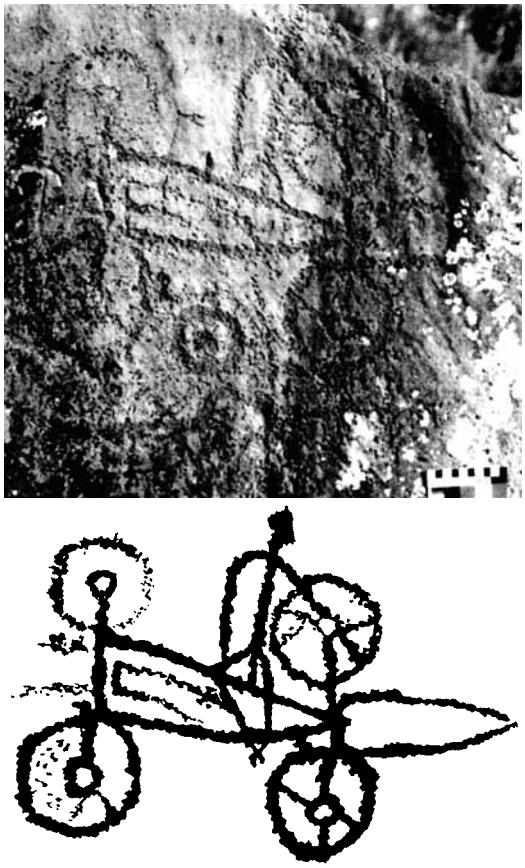


Fig. 35. The cemetery Esino 5. Image of the wagon. Photo and drawing [Savinov, 2002, p. 27-30, fig. 2].

measuring not more than 1x1 meters, is equipped with a seat, facing toward the harness horse, with two shafts at the edges, covered with a light structure on top of poles, like an umbrella or canopy, which in turn is covered with two layers of organic material – leather or felt on the outside and fine fabrics – from the inside. This coating is nailed studs "L"-shaped bases to the bars. From inside the tent is covered with a layer of red paint, which traces the geometrical ornament, caused by white, brown and dark red colors [p. 132]. All major parts are made from the chariot quite solid birch and elm, and some details of the seats (door handles) – from softer pine [determined by M.I. Kolosov].

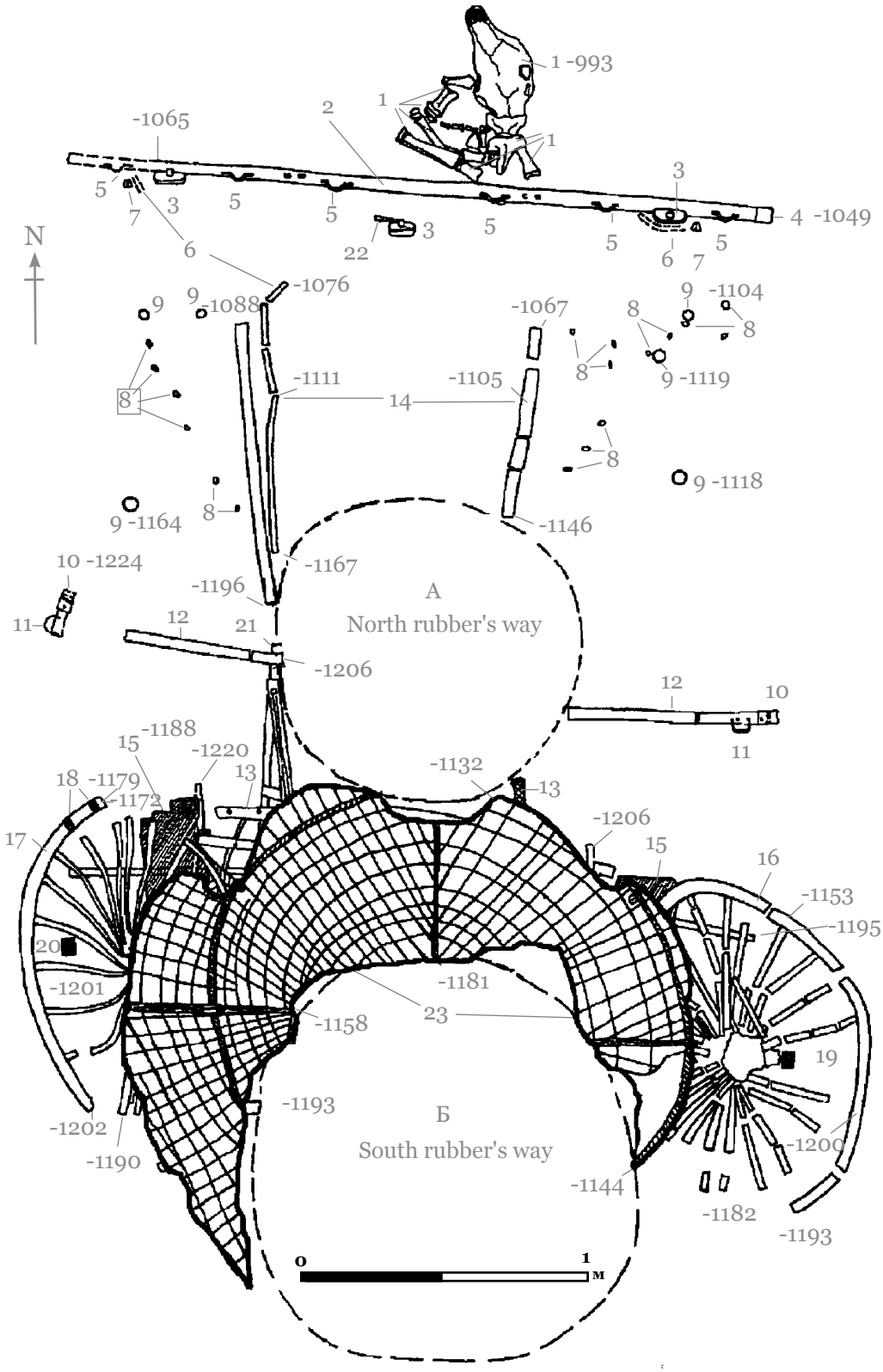


Fig. 36. Transbaikalia. Tsaram, barrow 7, the central tomb. The plan of the chariot before the removal of the tent:
1 – the horse bones (skull and metapodia); 2 – front jugular pole (yoke), 3 – jugular (yoke) tops; 4 – bronze tip of the yoke; 5 – bronze arcs; 6 – the remnants of thin round wooden poles; 7 – rectangular iron buckle; 8 – iron plaque; 9 – iron rings; 10 – bronze tops of back yoke pole; 11 – the iron arcs; 12 – back jugular pole; 13 – remains of a box – lattice shell of chariot; 14 – shafts; 15 – seat armrests; 16 – East wheel; 17 – Western Wheel; 18 – iron staples; 19, 20 – small iron bushings; 21 – iron plates; 22 – a lamb bone; 23 – tilt of cart. [Minyaev, Sakharova, 2007, p. 130-137].

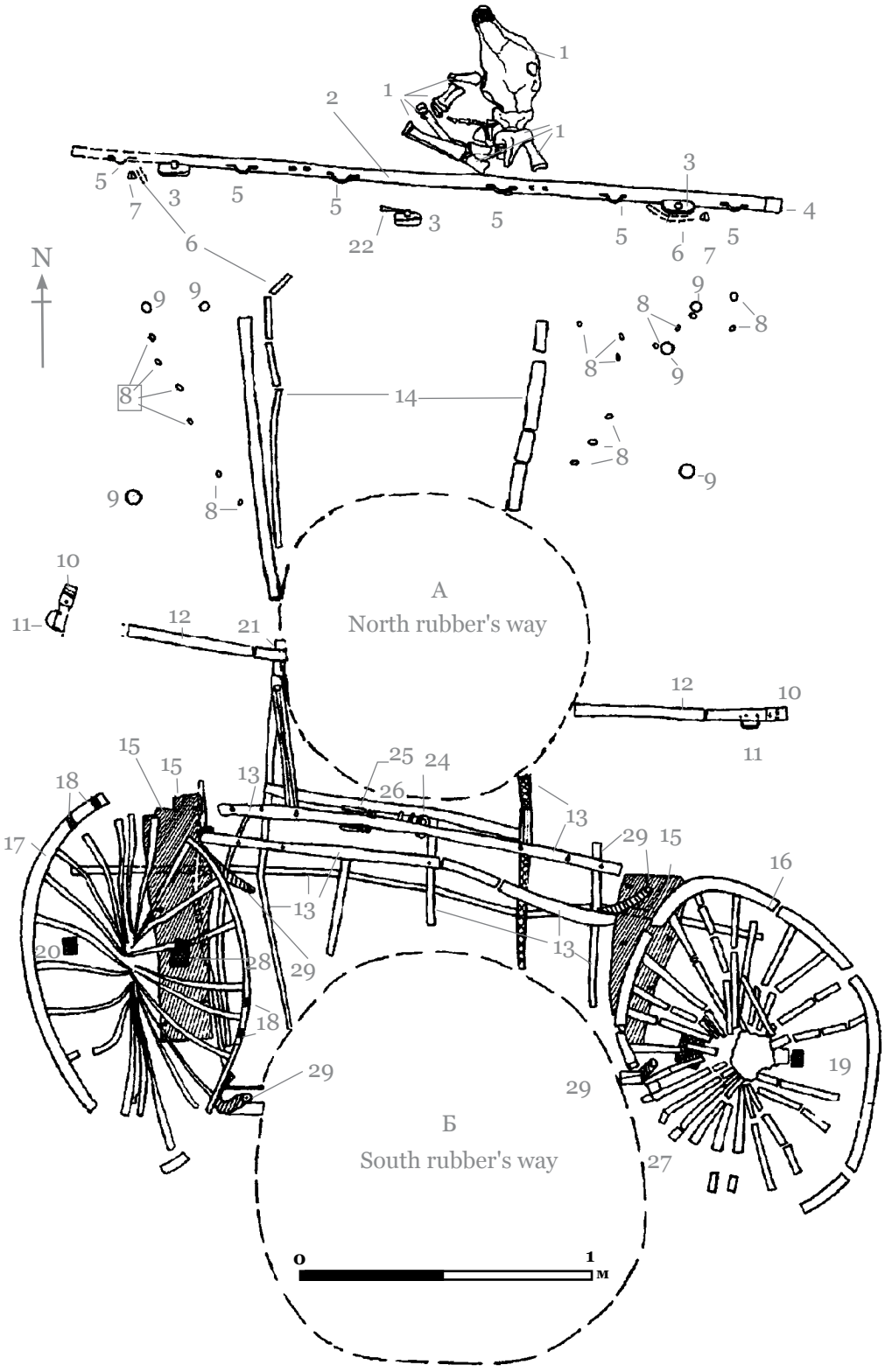


Fig. 37. Transbaikalia. Tsaram, barrow 7, the central tomb. The plan of the chariot after the removal of the tent:
1 – the horse bones (skull and metapodia); 2 – front jugular pole (yoke), 3 – jugular (yoke) tops; 4 – bronze tip of the yoke; 5 – bronze arcs; 6 – the remnants of thin round wooden poles; 7 – rectangular iron buckle; 8 – iron plaque; 9 – iron rings; 10 – bronze tops of back yoke pole; 11 – the iron arcs; 12 – back jugular pole; 13 – remains of a box – lattice shell of chariot; 14 – shafts; 15 – seat armrests; 16 – East wheel; 17 – Western Wheel; 18 – iron staples; 19, 20 – small iron bushings; 21 – iron plates; 22 – a lamb bone; 23 – tilt of cart (removed); 24, 25 – bronze fixators of wheels; 26 – iron checks; 27, 28 – the big iron bushings; 29 – fragments of wooden racks of tilt. [Minyaev, Sakharova, 2007, p. 130-137].

Survived two (!) yokes: the front – and back intact – destroyed predatory way. In the tomb discovered metal end of the yoke of iron on the axle checks, buckles, rings and other items of chariots harness. In the front of chariot fixed skull and limbs of a horse.

Authors of excavations suggest that the chariot was placed in the grave "in a partially disassembled" and dated it by 1 cent. A.D.[Minyaev, Sakharovskaya, 2007, p. 136].

This certainly applies to the crew selected earlier in this book, the Asian type (ancient Chinese) of representational chariots.

Pictorial sources (petroglyphs) are widely documenting this type of carts in all regions of Central Asia.

Here are some new images of this type (Fig. 38, 39).

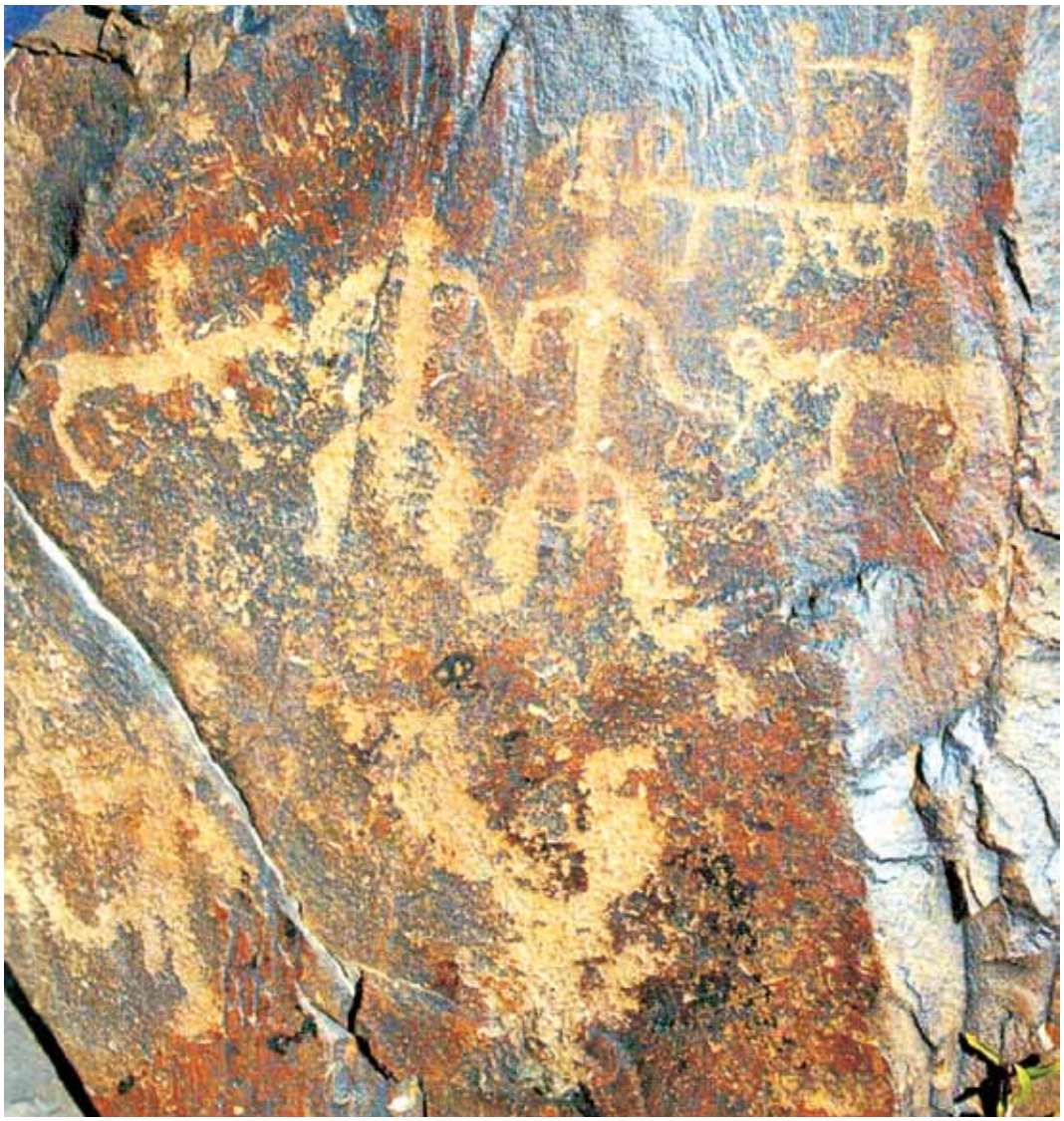


Fig. 38. Southern Kazakhstan. Bayan-Zhurek. The plane 111. Photo. [Samashev, Co Ho Chang et al, 2011, p. 193].

Fig. 39. Southern Kazakhstan. Bayan – Zhurek. Photo and drawing. [Samashev, Co Ho Chang et al, 2011, p. 221].

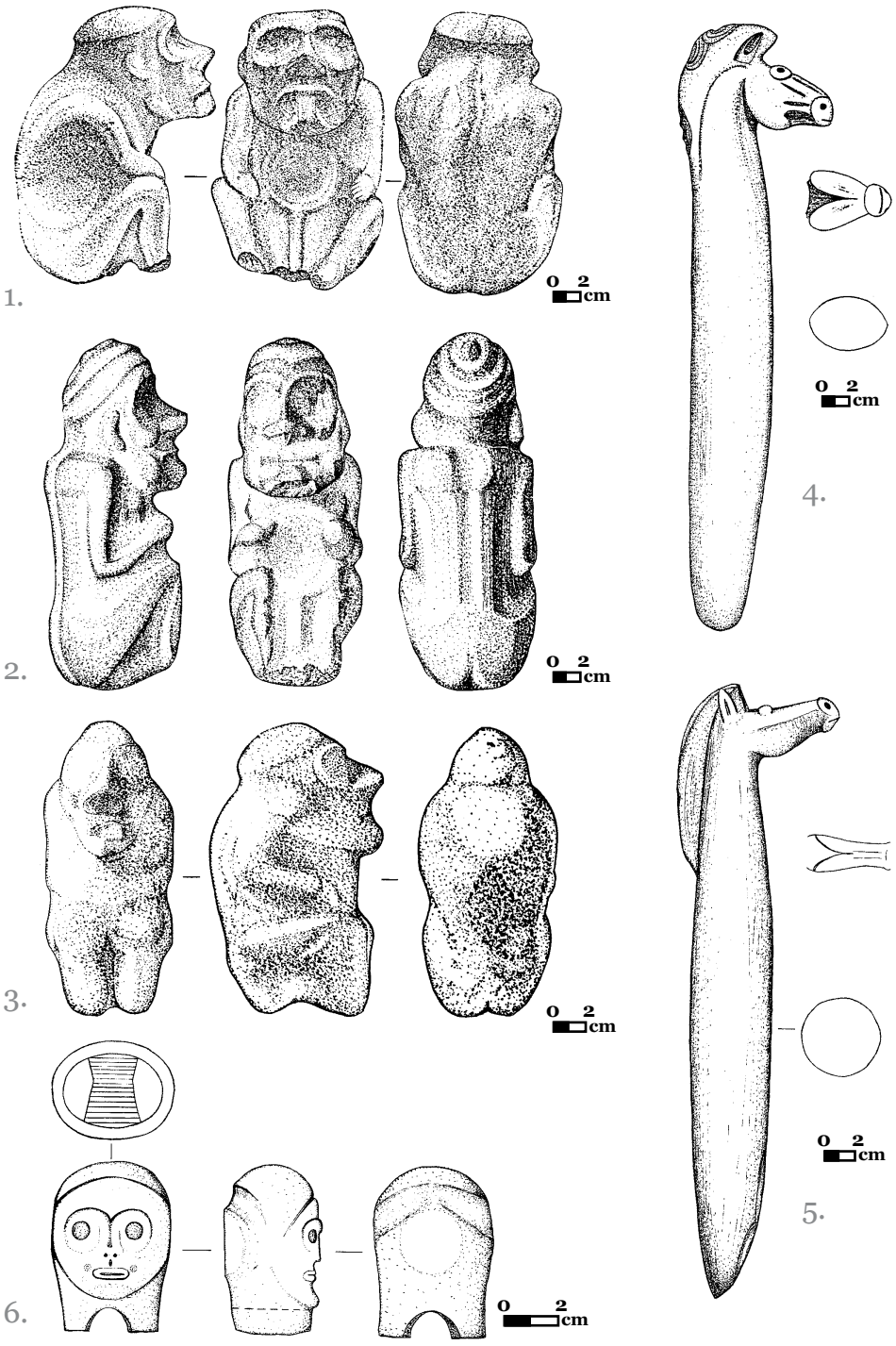


Fig. 40. Stone sculpture from Kazakhstan. Random findings:
1 – the figure of a seated person from Kostanai region, Kostanai Museum; 2 – the figure of a seated anthropomorphic person from Astana region, Hermitage, St. Petersburg; 3 – the figure of a seated person from Kostanai region. (№ 2), Kostanai Museum; 4 – stick with the image of a horse from Ust Kamenogorsk, Archaeological Museum of Tomsk State University; 5 – stick with the head of a horse from Semipalatinsk, Kazakh Museum of Arts, Almaty; 6 – detail of drilled pommel depicting a human head, Kostanai Museum [Chenchenkova, 2004, p. 113, 117,119, 125,127, 267].

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The list of reductions

AAH – Acta Archaeologica Academiae Scientiarum Hungaricae. Budapest.
AO – Arkheologicheskie otkrytia. M.: Nauka.
ASGE – Arkheologicheskii sbornik Gosudarstvennogo Hermitazha.
AEAE – Arkheologia, etnographia i antropologia Evrazii. Novosibirsk.
AV – Avesta.
BAR – British Archaeological Reports. L.
BAEIAP – The Bronze Age and Early Iron Age Peoples of Eastern Central Asia, ed. by V. Mair. Two vol. Washington, 1998.
BMAK – Baktrisko-Margianskii Arkheologicheskii Kompleks.
EAZ – Ethnographische-archaeologische Zeitschrift. Berlin.
ECUIE – Early Contacts between Uralic and Indo-European: Linquistic and Archaeological Considerations. Helsinki.
EW – East and West. Roma.
IAN – Izvestia Akademii nauk. M.: Nauka.
IGAIMK – Izvestia Gosudarstvennoi Akademii istorii materialinoi kulitury. M-L.
IJES – International Journal of Eurasian Studies.
IMKU – Istoria materialinoi kulitury Uzbekistana. Tashkent.
IRKSA – Izvestia Russkogo komiteta dlia izuchenia Srednei i Vostochnoi Azii v istoricheskom, arkheologicheskom, lingvisticheskom i ethnographi-cheskom otnosheniakh. StPeterburg.
IVGO – Izvestia Vsesoyiznogo Geographicheskogo obtshestva. Leningrad: Nauka.
JAOS –Journal of American Oriental Society.
JIES – Journal of Indo-European Studies.
JRAS – Journal of Roual Asiatic Society of Great Britain and Ireland.
KIO – kul'turno – istoricheskaia obtshnost' (oblast').
KGSB – Kaogu syuebao (Chinese).
KSIA – Kratkie soobtshenia Instituta arkheologii AN SSSR. M: Nauka.
KSIE – Kratkie soobtshenia Instituta Ethnographii AN SSSR. M: Nauka.
KSIIMK – Kratkie soobtshenia o dokladakh i polevykh issledovaniakh Instituta istorii materialinoi kulitury AN SSSR. M., M-L: Nauka
MIA – Materialy i issledovania po arkheologii SSSR. M: Nauka.
MIAR – Materialy i issledovania po arkheologii Rossii. M: Nauka.
MNO – Maikorsko – Novosvobodnenskaya Obtshnost'.
OAK – Otchiot Arkheologicheskoi komissii. StPeterburg, Petrograd.
PPS – Proceedings of the Prehistoric Society. L.
PTKLA – Protokoly zasedanii i soobtshenia chlenov Turkestanskogo kruzhka lyibitelei arkheologii. Tashkent.
RAE –Rossiiskii arkheologicheskii ezhegodnik. StPeterburg.
RGO – Russkoe geographicheskoe obtshestvo.
RV – Rigveda.
SA/RA – Sovetskaia arkheologia/Rossiskaia arkheologia. M: Nauka.
SAI – Svod arkheologicheskikh istochnikov.
SAIPI – Sibirskaia Assotsiatsia Issledovatelei Pervobytnogo Iskusstva. Kemerovo.
SE – Sovetskaia ethnographia. M.: Nauka.
SEDS – Stepi Evrazii v drevnosti i srednevekivie. Materialy konferentsii k 100-letiyu M.P.Griaznova. StPeterburg. Kn. 1 – 2002; Kn. 2 – 2003.
SGE – Soobtshenia Gosudarstvennogo Hermitazha. Leningrad.
SMAE – Sbornik Muzeia antropologii i ethnographii AN SSSR. Leningrad.
SM – Studien zur Megalithik: Beitrage zur Ur- und Fruhgeshichte Mitteieuropas 21. Weissbach.
TIIAE – Trudy Instituta istorii, arkheologii i ethnographii AN KazSSR. Alma Ata: Nauka.
TTKAEE– Trudy Tuvinskoi kompleksnoi arkheologo-etnographicheskoi expeditsii. M; Leningrad.
TKGPI – Trudy Kirgizskogo gosudarstvennogo pedagogicheskogo instituta. Frunze.
TrGIM – Trudy Gosudarstvennogo istoricheskogo muzeia. M.
VAAE –Vestnik arkheologii, antropologii i ethnographii. Tyumen'.
VAN – Vestnik Akademii nauk. M: Nauka.
VDI – Vestnik drevnei istorii. M: Nauka.
VLU – Vestnik Leningradskogo universiteta. Leningrad: Nauka.
ZIRGO – Zapiski Russkogo geographicheskogo obtshestva. StPeterburg.
ZORSA – Zapiski Otdelenia russkoi i slavianskoi arkheologii Russkogo arkheologicheskogo obtshestva. StPeterburg, Petrograd.
ZVORAO – Zapiski Vostochnogo otdelenia Russkogo arkheologicheskogo obtshestva. StPeterburg, Petrograd.

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